

+

D E N G U E F E V E R .

A CLINICAL SKETCH

and

AN APPENDIX

of

I L L U S T R A T I V E C A S E S .

by

F. W. MORE . M B. Ch B.

---

SINGAPORE, MARCH 1904.





## I N D E X   O F   C O N T E N T S.

	Page
Introduction.	1.
The Singapore Epidemic and After.	6.
General Description of the Disease.	12.
The Leading Symptoms in Detail.	17.
Etiology.	28.
Special Symptoms Complications & Sequelae.	36.
Differential Diagnosis.	45.
Pathology and Morbid Anatomy.	48.
Prognosis.	49.
Treatment.	50.
Appendix of Illustrative Cases.	53.
References.	125.

---



## INTRODUCTION.

Variability of type is a characteristic of epidemic dengue, and locality has an important influence in this relation. Hence an account of the disease as observed in Singapore may not be without interest. My observations are based upon (1) clinical attendance on 1100 cases during a period of two and a half years, (2) casual acquaintance with many more encountered outside in social and commercial relationships, and (3) experience of the disease in my own person on two separate occasions.

Dengue Fever may be defined as an infectious disease of tropical and subtropical regions, characterised clinically by (1) an initial severe febrile paroxysm accompanied by headache, pains in the joints and muscles, and great prostration, and followed by (2) a short period of milder fever of irregularly intermittent or remittent type, and (3) an eruption of variable character.

A host of Synonyms have been applied to this disease. These may be grouped under four heads.

(1) Descriptive e.g. Breakbone Fever, Scarlatina Rheumatica, Goodeve's Red Fever, Three days' Fever, Exanthesis Rosalia, Rheumatismus Febrilis Epidemicus and

a number of others.

(2) Place names e.g. Calcutta Fever, Aden Ague, Epidemic Eruptive Fever of India, &c, &c,

(3) Native Names e.g. Abu Rokab = the father of the knee joint; La Piadosa = the kind, the Charitable; Bou Hou = the Wailing Fever; Daggeian Fever &c.

(4) Miscellaneous:- Polka Fever, because its advent into Rio-de-Janeiro coincided with the introduction of the polka there; Pantomima; Epidemic Anomalous Fever; Date Fever, because occurring in the date season.&c.

The origin of the term "Dengue" is disputed. Popularly it is understood to be derived from the Spanish equivalent of the English word "dandy" and to have been applied to the disease as expressive of the character of the gait. Some however maintain that it is of Arabic origin and means depression, langour. Others that it is of Indian extraction, and others still, that it is a corruption of Aden Ague, thus:-  
(A) den (A) gue.

The writings of Gaberti on this disease are the earliest known. These date from 1779. From this time on to 1788 the disease seems to have prevailed pretty continuously and extensively - Egypt, The



Arabian Coasts, Batavia, Philadelphia, Coromandel Coast, Zanzibar and Southern Spain being visited in turn. Then for thirty years there are no records. In 1818 Lima sustained what would appear to have been an isolated outbreak. Another great wave involved Calcutta, Rangoon and Suez in 1824, East Indies, Brazil, West Indies, The Bermudas, the Shores of the Mexican Gulf and the Southern States of North America, from 1826 to 1830. Between the latter year and 1839 there was a second quiescent period, then a fresh "itinerary" as follows:- Alabama (1839-43), Calcutta (1844) Cairo (1845) Brazil (1846-48) New Orleans &c (1848-50) Peru (1850-52) Havana (1854) and Martinique (1855-56). After another isolated epidemic in Texas in 1861 comes the great pandemic of thirty years ago. The starting point of this is not clear. It may have begun as some authorities hold in Zanzibar (1870), and from thence reached Aden and Suez (1872), or it may have come by way of Cadiz (1867), Port Said (1868-71), Suez and the Arabian Coast (1872). From Aden it spread to Bombay, Calcutta and Burmah (1872), to Mauritius, Reunion, Singapore, East Indies, Cochin China, Formosa, Amoy and Shanghai (1872-73), to the West Indies (1874-75) and to Hongkong (1876).

The disease seems to have been endemic in Egypt between 1877 and 1889, breaking out in different



districts yearly during the hot season and disappearing with the colder weather. In the latter year it extended its range and invaded Syria, a large part of Asia Minor including Smyrna; Cyprus, Rhodes, Turkey (Constantinople), Greece. We have also had what may be termed sporadic epidemics in Charleston (1880), Texas (1885), Fiji (1885-6), U.S.A. (1888), Hongkong (1895), Texas (1897), Queensland (1895-97), Sydney (1898) and Hononulu (1898).

The established reputation of the disease for pandemic spread and for rapidity of advance along the main trade routes has been well sustained in the most recent visitation of all. This great wave originating in all probability in Java reached Singapore in August 1901. Thence it spread to the Native States (Sept:1901), to Hongkong and Macow (Octr:1901) to Bangkok (Decr:1901) and to Canton (June 1902) on the one hand, and to Penang (Novr:1901) and Burmah (Rangoon, April 1902, Mandalay &c June 1902) on the other. There are accounts of the disease as prevailing in Beyrouth in 1901-02, and the Sandwich Islands were visited about June 1903.

The following regions would appear to have some claim to be regarded as endemic foci:- The Nile Valley and Red Sea Coasts, the Mexican Gulf



Shores and the Lesser Antilles, Java and the Sandwich Islands.

---



THE SINGAPORE EPIDEMIC AND AFTER.

Of the various epidemic infections from which this Island has suffered within recent years that of dengue fever has undoubtedly been the most severe from the point of view of the number of persons attacked. In a community so cosmopolitan, and where a great variety of native therapeutic methods is practised, where the unqualified practitioner is unhampered by any form of medical legislation, and the quack allowed to follow his nefarious practices without let or hindrance, the difficulty of obtaining anything like a correct estimate of the proportion of cases to population will be readily understood. And when we consider further, in relation to the disease itself, the great number of mild cases which have escaped observation, its known clemency and the consequent tendency to dispense with medical help in treatment, and the fact that it is not notifiable, our difficulty becomes a practical impossibility. Yet, as the result of observation and inquiry I have no hesitation in saying that, taking the epidemic and endemic periods together, a majority - and that a very substantial one - of the inhabitants of the town and district have suffered from the malady. In this connection the following points are worthy of notice



(1) That for nearly thirty years prior to 1901 the Colony had been free from dengue, judging from the absence of records and from the evidence of the oldest residents.

(2) That there is a large migratory element in the population.

(3) That said population has enormously increased during the last thirty years.

(4) That with regard to the immunity conferred by a previous attack the generally accepted view is that it is short.

(5) That the disease is very highly infectious.

Authorities are in general agreement on this matter of high disease incidence on unprotected communities. Thus to quote a few:- "Dengue Fever arrived for the first time on record in December 1901. Dr Highet estimates that it attacked 95% of the Siamese and 80% of the Europeans." (Nightingale<sup>3</sup>). "I am under the mark when I say that in this particular epidemic quite 75% of natives and foreigners were attacked within a very few weeks" (Manson<sup>13</sup>). "In Galveston in 1897, 20,000 people were attacked within two months." (Osler<sup>24</sup>). "I believe that a considerable proportion of the population of the city of Victoria, Hongkong has been affected by the disease." (Stedman). "A large proportion of the native population suffered



and many Europeans." (Skae<sup>4</sup>). Dr Skottowe<sup>24</sup> writes of it as "attacking the entire white population and subsequently the natives." Wordsworth<sup>27</sup> in referring to an epidemic in Smyrna says, "It is estimated that four-fifths of the inhabitants of the town (150,000) have been attacked in three months." Aitken<sup>31</sup> says of Calcutta in 1824 "few remained untouched in a population of half a million." Anderson<sup>7</sup> says that in Canton 95% of the population was affected. Many more such instances might be quoted.

Isolated cases at first unrecognised and variously diagnosed erroneously (see Appendix Cases 1 to 6) occurred during a short period prior to the onset of the

Epidemic proper - This lasted from about the beginning of September 1901 to near the end of the year, had its highest disease incidence towards the end of October and was followed by an endemic period which still continues. Sporadic Cases are occurring at this date (March 1904). It was unquestionably a most severe epidemic and it excited an amount of interest among all classes only equalled by that which attended the great Influenza Epidemic at home in 1889-90. And here it may be worth while noting that the last-named disease forms a ready parallel not only in the matter of disease incidence but in many of its



general characteristics as well e.g. Both are of pandemic type and of highly infectious character spreading with great rapidity. In each a two to four months epidemic in any one locality is followed by a period of endemicity of variable duration. Speaking generally they are alike indiscriminate in attacking all classes, races, ages, and both sexes. There is a marked similarity in the two in the length of the incubation period, in the abrupt nature of the onset, in the disproportionate degree of attendant prostration, and the often-times alarming character of the symptoms while they last, in the time covered by the illness, in the liability to recurrence, and in the frequently protracted convalescence. The two diverge however and mainly on the lines of climatic conditions, bronchial and pulmonary symptoms and cutaneous phenomena.

The Penang epidemic lasted three months (Skae<sup>4</sup>). In Canton the disease prevailed in epidemic form during June, July and August 1902. (Anderson<sup>5</sup>). An epidemic lasted two months in Beirut. Scheube<sup>12</sup> says that the duration of an epidemic is generally several months and on the conclusion sporadic cases often occur for weeks, months or even years after. To quote Manson<sup>13</sup> - "In about eight weeks from the first appearance of the epidemic.....all the susceptible apparently had passed through it."



As instancing the general prevalence of the disease on the community it was no uncommon experience to find whole families including the servants suffering at the same time from the malady in one or other of its various stages. All the ten persons who comprised the household of which the writer was a member were prostrated in somewhat regular succession within a period of three months. Of 21 Europeans employed in one department of a large Dock Company for which the writer is deputy medical officer, 14 were absent on one and the same day suffering from dengue, while of the other 7 all but one had either had the disease previously or contracted it subsequently. In another department of this same Company 28 of the 30 European employees had had the illness by the end of October. It is not too much to say that most business houses were considerably inconvenienced. By the end of the year it was exceptional to meet one among friends or acquaintances who had not had the prevailing complaint.

In the Journal of Tropical Medicine, August 15th, 1903 we read that in Hilo (Sandwich Islands) the Court was adjourned for a week at the end of June because of the illness of so many jurors, lawyers and court officers. "It has thrown many disagreeable hindrances in the way of export business..... Many offices were closed because all the clerks were



ill and trade was at a standstill" (Berlin Correspondence - Daggeian Fever<sup>25</sup>). Manson<sup>13</sup> says that in Amoy in 1872 "the business of the town was seriously interfered with."

The endemic period here has been characterised by a series of short bursts of dengue of gradually decreasing severity, recurring every few months, with sporadic cases in the intervals. New comers are still almost invariably victimised.



GENERAL DESCRIPTION OF THE DISEASE.

Premonitory Symptoms - The prodromal stage is usually very short indeed, and only exceptionally does it extend to one or two days. Lassitude, loss of appetite, headache, restlessness, cough, pharyngitis, bronchial catarrh and mild bronchitis are among the premonitory symptoms.

Almost all authorities are agreed on the comparative absence of premonitory symptoms e.g. Skae<sup>4</sup> mentions that they were "entirely absent" in his cases "except slight rigors in two children". Manson<sup>13</sup> says that an attack "may be preceeded for a few hours by a feeling of malaise or perhaps by painful rheumatic - like twinges in a limb, toe, finger or joint." Wordsworth<sup>27</sup> has it that "in a few cases however a feeling of malaise lasting twenty-four to forty-eight hours preceeded the attack." Scheube<sup>12</sup> - "it is occasionally preceeded by prodromal symptoms for a couple of days - general indisposition, depression, giddiness, frequent yawning, gastric disorders &c."

Mode of Onset - Very commonly the person retires to rest at night in good health to wake up about 1 a.m. with a chilly feeling, and aching in bones, joints and muscles. For the remainder of the



night he is sleepless, tossing restlessly in a vain attempt to find a comfortable posture. By day break the slightest effort at locomotion is painful, and he is compelled to resume his couch. In addition there is generally nausea, not infrequently actual vomiting, and it may be faintness on assuming the erect attitude. Or again, in another case, he may have gone to work, quite well except for a sense of weariness or of stiffness or slight pain on movement of one joint - very frequently a knee or a finger joint - and in the course of a few hours be forced to take to bed, his whole locomotory system racked with pain. Less often sudden faintness or giddiness ushers in the attack.

While on the one hand there are many cases of a milder type as regards onset, on the other, cases of a still more fulminant character sometimes occur, when, in an almost incredibly short time, even strong men are so prostrated with pain as to be compelled to suspend all voluntary movement. In young children a convulsion is often the first recognisable symptom.

Rigors, such as are seen for example in malaria when the whole body shakes, the teeth chatter and speech is interrupted, were extremely rarely observed. In the majority of cases a feeling of cold was experienced, and was very frequently expressed as like cold water running down the spine, or slight shivering was met with. Hot and cold spells often alternated for days. In about 25% not any one of



these sensations was present.

Various Authors on the onset:- "Quite sudden.....may be by actual rigors, but more often by chills and a feeling of cold down the back..... occasionally there may be actual vomiting accompanying the chills and rigors" (Stedman<sup>1</sup>). "Always sudden" (Skae<sup>4</sup>). "Sometimes shivering or a feeling of cold down the back ushers in the attack." (Pridmore<sup>5</sup>). "Markedly sudden.....often coming on as a shock mostly at night or in the early morning on rising.....with slight rigors rarely shivering fits" (Scheub<sup>12</sup>). "Usually sets in quite suddenly.....Sometimes the fever is ushered in by a feeling of chilliness or even by a smart rigor" (Manson<sup>13</sup>). "The attack is often in the night." (Maclean<sup>14</sup>). "Ordinarily an individual in good health suddenly has a shivering fit." (Wordsworth<sup>21</sup>).

Subsequent Course - For the first twelve to twenty-four hours the patient's distress increases. The temperature mounts up rapidly - it may reach 104 - 105 F. in the course of a few hours - with severe headache and pain on movement of the eyeballs. The joint and muscle pains become aggravated, in some cases indeed he is forced to cry out on attempting to move in bed, and he may be altogether unable to raise himself up without help. There may be deep-seated aching in the long bones, and there is usually one joint - a



a knee, ankle or finger joint - which is specially affected. Loss of appetite is an almost invariable complaint. The tongue at first "white strawberry" in appearance, usually becomes covered later with a thick brownish fur, but remains moist throughout, and generally with clean edges and tip. There is often an absence - or at the least a perversion - of taste, with nausea at sight of food, a feeling of weight in the epigastrium, and very commonly vomiting of everything taken into the stomach. Diarrhoea too may come on at this stage, but more often it occurs later accompanying the fall of temperature, and constipation is the rule. There is frequently marked prostration, and extreme restlessness and sleeplessness add greatly to the general discomfort.

On the second day there is, as a rule considerable abatement of the above symptoms especially under treatment. The temperature has fallen - it may be 100 F. or even lower. The pains are less acute though still present on active movement, particularly in the lumbar region and in the eyeballs. The extreme restlessness has become greatly modified. The gastric symptoms too are usually less marked, and altogether the patient is much more comfortable if somewhat collapsed.

In the average case this improvement contin-



ues, and by the end of the third day he is able to leave his bed with normal morning temperature, all but free from pains, and expressing himself as "pretty well, but weak." He may even return to office next morning, but on the fifth or sixth day a rash appears and developes rapidly, and this may be accompanied by more or less recrudescence of the pains or fever or of both. In mild cases these secondary symptoms may not affect him much, but often he is compelled to lie up again, and his convalescence may be very slow indeed.

---



THE LEADING SYMPTOMS IN DETAIL  
REFERRED TO FOUR SUCCESSIVE STAGES.

---

1. The INITIAL PYRETIC STAGE.

(a) The Pains and Headache. - In no other febrile disease, not even excepting Acute Rheumatism is there such a rapid and general derangement of locomotory function. The pains in bones, joints and muscles can only be described as formidable. Fortunately they are as a rule transient and cessation from voluntary movement gives relief in great measure. They are usually the first symptom to impress the patient and with a rapid accession but a more gradual decline generally persist for two to three days. They may become so severe in the course of a few hours as to render the subject incapable of all voluntary motion. Somewhat general in their distribution at the onset, they become later more localised, or they may be peculiarly localised from the first. Often of fleeting character they are difficult to locate with exactness. They are rarely altogether absent. Old people and rheumatic subjects suffer most, children and young persons least. They frequently undergo a slight recrudescence with the advent of the secondary rash - increasing after

\* This remark applies more especially to the period of epidemic proper. Of the earliest cases, as of those occurring later, a greater proportion was mild in respect to pains.



rest and gradually disappearing with movement.

Bones, muscles and joints are involved. The long bones ache, the muscles - most frequently those of the lumbar region, eyeballs and calves - are painful on active movement, rarely tender to touch however, while cramps and "lightning" twinges are common. Momentary loss of power - a slowness in response to the will - in an individual, or a group of muscles, was frequently illustrated.

The joint pains are probably in many cases merely referred. The smaller joints are more frequently affected and absence of swelling is the rule, to which however there are frequent exceptions in the shape of puffy oedema, fluid effusion, and teno-synovitis. Joints previously affected either by injury or disease were specially attacked. Generally speaking passive movements when unresisted were painless and excepting those cases with joint sequelae active mobility was rarely interfered with beyond the first week. Sometimes a stiffness in one knee or other joint, or pain on movement in the region of one tendo-Achilles with or without slight swelling remained for a day or two longer. Persistence, or a fresh development of joint symptoms constituted the most frequent sequel to this disease.



While most writers agree in characterising the pains as severe, some would appear to have found this a feature of milder character all through. At least this is the impression one gets from reading the descriptions of Sandwith<sup>28</sup> and Skae<sup>4</sup>. The former says - "The individual is obliged to take to bed on the second or third day on account of muscle and joint pains and giddiness and syncope." The latter writes - "In the early part of the epidemic pains were usually entirely absent or not more marked than they often are in malarial fever..... In only one did it at all approach the condition described by Manson in which the pain caused by muscular movement more than counterbalances the advantage a purgative might otherwise bring." Maclean<sup>14</sup> says that Goodeve makes no mention of the articular pains.

My experience does not lead me to agree with Scheubé<sup>12</sup> (translator Falcke) when he says - "The pain that is characteristic of dengue fever has its seat in the knee joint," for I found nothing specially characteristic of the knee joint pain as compared with that in other joints, for example the tarsal, which were quite as often affected.

The headache was the most constant of all the symptoms. It was often intense, splitting or





C.D.



Mr. R



F.W.M



Mrs. S



Mr. J.



D.N.

## Dengue Temperature Charts

### The More Common Types.



Mr. G.



Mr. B



M: B



Mr C



Ref. 1



Wol - 3

## Dengue Temperature Charts

### The Less Common Types



boring - generally frontal but sometimes referred to the temples - rarely hemicranial.

Matas<sup>16</sup> thus describes it - "One of the most constant and truly reliable and earliest symptoms is the cephalalgia..... The severe pain in the head is very distressing &c."

(See Appendix, Case 9. also Cases 59 to 68.)

(b) The Temperature - In 95% of my cases the course of the temperature was marked - subject to slight variations - by an initial acute paroxysm extending over three or four days, and succeeded by a similar period of mild irregular fever. The paroxysm was characterised by a rapid rise -  $102^{\circ}$  -  $103^{\circ}$  F. (Sometimes  $104^{\circ}$  -  $105^{\circ}$  F.) in the course of a few hours, a brief fastigium and a more gradual decline. By way of variation, sudden crisis sometimes occurred, especially in children, or the fastigium was sustained for twenty-four hours, rarely longer. During the period of mild fever, the temperature ranged from  $1\frac{1}{2}$  degrees above, to 1 degree below normal, with very frequently a still higher rise on the appearance of the secondary rash. The remaining 5% represented various departures from the above type. (See appended charts.)

Most Authors recognise the secondary rise of temperature. Skae<sup>4</sup> however says - "The appearance of the rash was in no case accompanied by a rise of



temperature." And Pridmore<sup>5</sup>:- "The second rash has never been accompanied by more than a trifling rise of temperature." There is no doubt that in other points too the course of the temperature varies in different epidemics e.g. "No one in Fiji has met with the complete intermissions with apyrexia or subnormal temperature described by Dr Christie<sup>6</sup> at Zanzibar and Dr Thomas at Savannah." (Skottow<sup>24</sup>). Wordsworth<sup>27</sup> has found that in grave cases the initial fever remains for three or four days at about 40 - 41 C.

(c) The Primary Erythema and the Dengue Physiognomy. - The primary erythema was in general of a simple character, varying in degree from a slight malar flush to a marked congestion of the whole cutaneous surface, and within these limits it was present in 88% of cases - excluding of course the darker-skinned natives. It appeared within the first twenty-four hours and was of fugitive character, its duration - a few hours, rarely two or three days - depending on its intensity. The condition most frequently met with was that of more or less congestion of the face and upper part of the trunk, of scarlatiniform type. By way of variety brighter roseolar spots were sometimes superadded, or a further degree of inflammatory action took place resulting in the production of isolated pemphigoid bullae, or the erythema assumed the character of an urticaria or of an evanescent rubella.



Desquamation in slight amount was occasionally noticed. In plethoric subjects the congestion often persisted until supplemented by the secondary rash.

This initial skin congestion would appear to be a more constant feature of some epidemics than of others. Thus Stedman<sup>1</sup> found "an initial rash" in a "small proportion of cases" only. Skae<sup>4</sup> observed that "congestion of the skin - the initial eruption - was well marked in a few cases." Pridmore<sup>5</sup> says - "The initial rash described in books I have only seen in a few cases. In these it has consisted of little more than a hyperaemia of the skin of the face." Matas<sup>16</sup> writes - "In India this first rash has been observed in one half of the cases according to Martialis - in two-thirds of them according to Charles ... it varies in intensity from a slight flush to a well marked scarlatiniform erythema."

Very frequently, when the fever is at its height, the general appearance and expression of the face is a valuable aid in diagnosis. The injected conjunctivae with evident photophobia, the not uncommonly puffy condition of the eyelids and of the surrounding loose tissues, the fiery-red boiled-lobster bloated look of the face with its often-times anxious or even pained expression, give an appearance which is pretty characteristic.



## II. THE INTERVAL

(d) The Prostration - This symptom is sometimes extreme, and indeed may lead to a fatal result in debilitated subjects (see appendix case 71).

Ordinarily it is not severe enough to give rise to any apprehension, but it is well to remember in every case that an element of danger is associated with this stage more than perhaps with any other period of the illness. The degree of prostration does not necessarily depend upon the severity of the original symptoms. Giddiness, restlessness, anorexia and vomiting are often associated with it, and general stiffness and "soreness" muscular cramps and "lightning pains" may remain to add to the patient's distress.

Osler<sup>29</sup> says that "the prostration mental and physical is out of all proportion to the severity of the primary attack," and most other writers express themselves to the same effect. Many text-books, among them those of Osler<sup>29</sup> and Taylor<sup>15</sup> define this interval as an apyretic one and Manson<sup>13</sup> and Scheube<sup>12</sup> convey the same impression in their writings. My experience leads me to think that it might be more fitly characterised as a period of unstable temperature.

## III. The STAGE of SECONDARY PHENOMENA.

(e) The Rash and its Associated Symptoms -



The secondary rash appeared between the fifth and the sixth days in 86% of cases. Sometimes it shewed as early as the third day, and exceptionally as late as the 7th. On an average it remained out about 48 hours. It was entirely absent in 2%. It presented a considerable variety of types in different cases. The chief of these are:-

(1) The Measly or Maculo - Papular type. - This was by far the most common variety (70%) and its amount and distribution varied within very wide limits, from a few rose-coloured spots beneath the palmar epidermis, to a condition in which but little unaltered skin remained. At first sight it was often impossible to say that the condition was not one of true morbilli. (See Differential Diagnosis)

(2) The Miliarial type (17%) - This formed a connecting link between the previous group and that immediately succeeding, through eruptions like those of Rotheln and Scarlatina on the one hand, to conditions akin to Lichen Acuminatus, Prickly Heat and certain drug rashes (copaiva, belladonna &c) on the other. The small bright-red discrete papules characteristic of this type were generally aggregated in patches on the limbs, forehead &c., but very frequently the entire body surface was involved. Sudaminal vesicles and scattered pemphigoid bullae were occasional additional features. Sealing followed in the more aggravated cases.

(3) The Urticarial type (7%) - Under this head



is included a pruriginous variety as being closely allied. Excessive itching was a marked feature of this, and to a less extent of the previous type.

(4) Associated Conditions - Not infrequently large tender erysipelatous-like patches appeared on the limbs, trunk or face. Purpuric spots - petechiae, ecchymoses - were occasionally seen, and, in at least one instance, erythema nodosum was met with. In some cases the types were more or less mixed.

In general, the presence of the terminal rash clinches the diagnosis. It affects the hands, forearms, chest - front and back - and lower limbs most frequently, and usually in this order of spread, disappearing in the same order. The face and abdomen are less often involved. The color in Europeans is dusky-red. Depending on its intensity, it is attended by more or less oedema of the cutaneous structures, and the hands may be considerably swollen. Prickling, tingling and hyperaesthesia are common accompaniments, and, following on the desquamation, the tips of the fingers and the plantar surfaces of the heels may be red and tender. In mild cases, especially in children, the eruption may be the first noticeable sign of the disease. Its amount bears no relation to the severity of the previous symptoms. Before concluding that it is entirely absent in any one case, the extensor surfaces of the elbows and knees should be carefully



examined. As already noted, the temperature frequently rises at this stage, and there is usually more or less recrudescence of the pains. In short, there may be a complete repetition of the primary symptoms, only less severe. As a rule the more profuse and general the terminal rash the higher the secondary temperature.

(see Appendix, cases 3, 6, 12, 16, 18, 20, 30, 40, 41, 42, 43)

Various minor differences are noted in respect to the dengue exanthem as described by various writers. These are such as relate to the date of its appearance, the parts affected, the presence or absence of desquamation and its amount, &c; but most are agreed as to its double phase and polymorphous character. Sandwith<sup>23</sup> however writes:- "I have not been able to satisfy myself as to the existence of an initial and a terminal rash as described by some authors," and several of the older writers fail to mention the double appearance of the rash.

#### IV CONVALESCENCE.

This was rapid and uneventful in the majority of cases. Among the conditions causing delay were anorexia, intermittent slight febrile attacks, great physical and mental depression, continuance or a return of pains in limbs and back; and swelling of joints, around tendons &c.



Relapses - Writers on this disease are not at one as to what they mean by the terms "relapse" and "recurrence" as applied to it. In order therefore to avoid confusion, I will, for purposes of this article, define a relapse as a repetition of an attack before complete recovery, and a recurrence as a repetition of an attack after complete recovery, and go on to say that I have seen no relapses, but many recurrences. In a few cases, I have met with a slight return of fever, lasting for a few hours, and this might, or might not be associated with slight pains; but these conditions were altogether too short-lived or too trifling to warrant the term relapse being applied to them, and moreover it was rarely possible to say that the dengue infection was more than a predisposing factor in their causation.

---



E T I O L O G Y.

Nearly twenty years ago McLaughlin<sup>16</sup> described a coccus which he sought to identify with this disease. Hunt<sup>12</sup> found mobile granules in the blood &c of dengue patients. In 1902 Harston<sup>2</sup> 'demonstrated a bacillus', and about the same time Graham<sup>8</sup> came forward with the discovery in the blood, of an organism resembling the aestivo-autumnal parasite of malaria. This last investigator also holds, on the strength of some experiments made by him, that the disease may be propagated through the agency of a species of culex. So far as known to me, little or no confirmation has ever been given to these discoveries; and our knowledge of dengue etiology is still largely theoretical.

In the Journal of Tropical Medicine, August 15th 1903, we read that the Honolulu Board of Health, acting under the belief that dengue is spread by mosquitos "has instituted a crusade against these enemies of the human race."

My experience has convinced me that the paramount factor in the spread of this disease is human intercourse. Direct contact would appear to be unnecessary but aerial spread is probably limited to the immediate neighbourhood of the infected person - the disease finding an analogy with Typhus in this connection. I have repeatedly observed that, whereas in



crowded ill-ventilated dwellings the illness spread rapidly among the inmates rarely sparing any, in the better class, well-ventilated houses, or where some attempts at isolation had been made, the dwellers were more often attacked seriatim and at longer intervals, while one or more individuals frequently remained entirely unaffected for the time being.

Only two cases of dengue were admitted to the General Hospital<sup>33</sup> here during 1901 - the epidemic year. The institution is situated in the suburbs. Tanglin barracks enjoys a more isolated situation still, and I have it on good authority, that, though malaria was common, comparatively few cases of dengue had occurred among the 'Manchesters' stationed there. Dr Keogh<sup>2</sup> is reported to have said that no case of dengue had been admitted to the naval hospital, Hongkong, from the fleet, though at one time several men-of-war were in the harbour.

Further I am of opinion that the active infective material may hang about rooms, and adhere to clothing and other articles. New-Comers, even late in the endemic period, when the disease was practically confined to such, were almost invariably attacked within a few weeks of their arrival and that apparently without direct exposure.

For those in attendance on cases of the



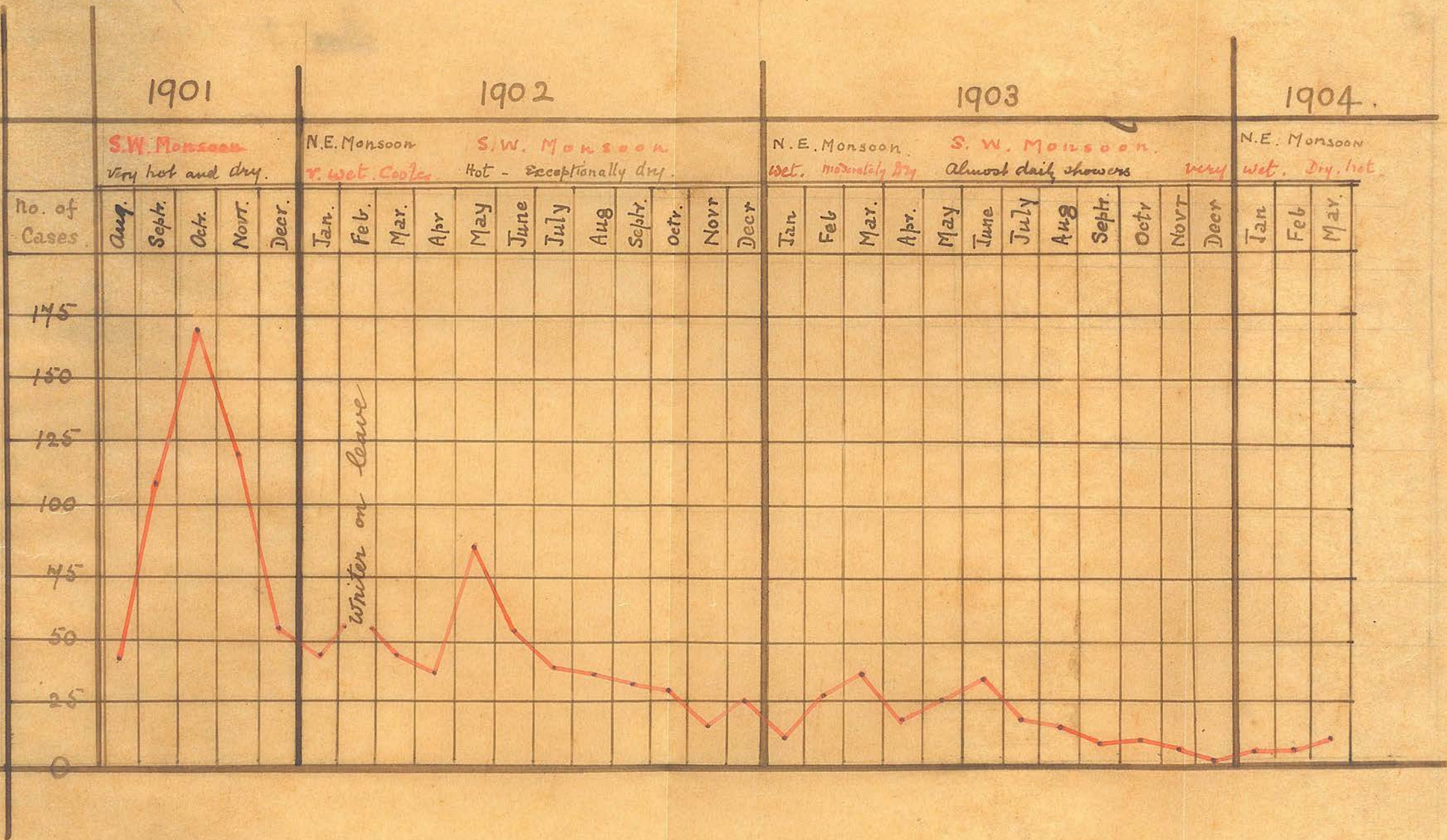


Chart of Seasonal Incidence of Writer's Dengue Cases



illness, the, advance and fastigium stages of the primary pyrexia were undoubtedly the most dangerous periods, and apparently a very short exposure sufficed. The majority of medical men here have now had experience of the disease in their own persons. Some individuals withstood the infection longer than others. Accident, over-exertion, prolonged exposure to sun &c seemed to render the subject more vulnerable. Previous illnesses too increased the liability to attack; and general insanitary surroundings appeared to operate in lowering the resisting power.

With regard to climate, I have formed the opinion, which the appended chart helps to support, that the meteorological changes which take place here are too slight to exert any marked influence on the course of epidemic dengue.

In Hongkong<sup>32</sup> the advent of the colder season checked the 1901 epidemic; but the disease broke out again during the summer of 1902, and in that year more cases of dengue were admitted to the hospitals than of any other disease. Sandwith<sup>28</sup> says that the disease "has been first discovered in August or September, and has invariably disappeared about December, on the setting in of colder weather", in all of thirteen successive years in which it visited Egypt. The same seasonal incidence was observed, almost invariably,



in relation to the various American and other epidemics outside the tropics.

The question of telluric influence in dengue is undetermined. The building of the Singapore - Kranji Railway caused considerable soil disturbance in and around the town, from the beginning of 1901 onwards. Altitude has a bearing on the disease in so far, as it leads to different meteorological and hygienic conditions.

Stedman writes of Hongkong - "The disease has been chiefly prevalent in the city, and I have seen very few cases in the higher levels. In fact at the Peak I have only had two or three cases under my observation."

Analysis of the notes on 500 cases - mostly contract patients - brings out the following additional points:-

(1) No age is exempt, but the liability to attack would seem to decrease after the age of 40.

Age	under 5	5-10	10-20	20-40	40-60	over 60	Totals
Dengue	46	41	40	343	28	2	500
All other Diseases	51	39	41	302	59	8	500

"Dr Stedman.....stated that the disease appeared to be unusual in children" Sandwith<sup>28</sup> says



"children of all ages get it more lightly than adults"  
This is not my experience, though they recover sooner.

(2) Sex is without marked influence. Of 200 cases in family practice, where it may be assumed the sexes are about equally represented, 106 were males and 94 females.

(3) There is apparently no race immunity, but Europeans would appear to be specially liable. In this table the latter are in excess but the other numbers pretty well indicate the proportions in which the various races are represented in my practice.

Europeans	Eura- sians	Malays &c	Chin- ese	Indian Races	Jews	Arabs	Total
182	93	9	169	11	26	10	500

It must be remembered that questions of hygienic surroundings, of exposure to infection &c may sometimes account for what is set down to racial peculiarities.

(4) The disease is independent of occupation, social position, habit of body, long or short residence, habits as to food, and drink &c. I have not been able to discover any special relationship between this disease and malaria.



(5) The recurrences in the  $2\frac{1}{2}$  years of epidemic and endemic prevalence amount to 4% only. An interval of eight to twelve months between attacks was a common one. One patient had three attacks within fifteen months (see case 17). These recurrences are most probably fresh infections.

With regard to this question of protection opinions are greatly at variance thus:- "As a rule however susceptibility to the disease is exhausted by one attack" (Manson<sup>13</sup>). "No immunity is afforded by a previous attack of the illness" (Scheube<sup>12</sup>). In general the view is maintained that the protection is short. It seems likely that epidemics differ in their power of conferring immunity, depending on the severity of the intoxication, and other circumstances.

(6) The incubation period was three to four days in 80 % of the cases in which the source of infection seemed clear. Of the remainder, 15% had a shorter, and 5% a longer period. These last however must remain doubtful in view of the possibility of the infection being retained in articles of clothing &c.

Pridmore<sup>5</sup> puts the average at three days. Graham<sup>8</sup> thinks the incubation period is about five days. Scheube<sup>12</sup>:- "maximum duration not more than four or five days, but it usually lasts one or two days,



and often only a few hours." Manson:<sup>13</sup> "One to three days seems to be near the truth." Matas:<sup>16</sup> "Average four days." "According to Dr Hirschfield<sup>20</sup> the period of incubation is about two weeks." Dr Hare<sup>20</sup> says "there is plenty of evidence to shew that the incubation period does not extend beyond one week."

(7) As the epidemic period passed into the endemic, a gradual change of type was observable. A milder onset, decrease in the severity of the pains, a more variable course of temperature, and a less constant secondary rash were the main indications.

(8) Among concurrent infections likely to give rise to confusion in diagnosis, a mild measles epidemic prevailed in the summer of 1902. There was also about this time, a considerable number of small-pox cases, which, in their early manifestations, bore a close resemblance to dengue.

Maclean<sup>4</sup>, Matas<sup>16</sup> and others mention the close association of dengue and yellow fever epidemics in countries where both are liable to prevail.

One case came under my observation of what appeared to be dengue in a terrier, the constant companion of her master while the latter suffered from the disease. The evidences were, a rise of temperature, stiff walk, refusal of food, disinclination for



play, and the fact that these symptoms occurred somewhat coincidentally with the master's illness, and disappeared in a few days. Scheube<sup>12</sup> mentions that cows, horses, dogs and cats were affected in India; and whole herds of cattle in America.

Appendix Cases 7 to 23 (both inclusive) will illustrate the main etiological points.

---



SPECIAL SYMPTOMS. COMPLICATIONS and SEQUELAE.

1. Alimentary System.

A greater or less degree of simple catarrhal stomatitis was present in most cases, and this was frequently associated with a heavy disagreeable odour from the breath. Sometimes ptyalism occurred. Small reddish papules, and vesicular ulcers with red areolae were often met with on the tongue and inside of lips or cheeks, and a variety of ulcerative stomatitis with swelling of the salivary glands was present in 5% of cases, mostly in natives living among insanitary surroundings. Bleeding from the gums was not infrequent.

The pharynx often participated in the general hyperaemia of the mouth, and pain on swallowing was a frequent complaint. Four per cent of cases shewed a mild follicular tonsillitis.

Vomiting occurred in 22% of cases. It was seldom very persistent. In some instances it was of a bilious character. Blood in slight amount was mixed with it in 2%. Diarrhoea, more or less of the critical variety, was present in 26%. There were seldom more than 10 - 12 stools, - usually only 3 or 4 - but these were generally of peasoupy character. Blood and slime were mixed with the faeces in 3%.

No change in the outline of the liver could



be attributed to this disease. In only one or two instances was slight jaundice observed.

Anorexia was an occasional sequel.

Skæe<sup>4</sup> and others met with vesicular eruptions of the mouth. Both Maclean<sup>14</sup> and Matas<sup>16</sup> mention ptyalism. Scheubé<sup>12</sup> notes tonsillar swelling, hæmatemesis, malaena, and occasional liver enlargement. In connection with this system read cases 24 to 28 also case 20 in the Appendix.

#### 11 HAEMOPOIETIC SYSTEM.

Enlargement of lymphatic glands was detected in 24 % of cases, In order of frequency the superficial inguinal and femoral, the superficial cervical, the axillary, the brachial, the occipital and the posterior auricular were those mainly affected. Generally speaking the time of appearance of the glandular enlargement coincided with that of the secondary rash. The swellings varied in size from a pea to a pigeons egg, and were discrete, hard, with the skin freely moveable over them, and with no overlying inflammation as a rule, tender to touch and causing a certain amount of pain on movement of the parts involved. They gradually subsided after the disappearance of the eruption.

In no case under my observation were there any symptoms pointing to a primary affection of the



spleen in this disease. Variouslly stained blood-films were examined microscopically in several instances, but the results were negative in each.

Skæ<sup>4</sup> found enlarged glands in two cases only. Pridmore in 75 % of cases. Sandwith<sup>28</sup> says that enlargement of lymphatic glands was seen in delicate patients only, and as a minor symptom.

(see appendix cases 29 to 34.)

### III CIRCULATORY SYSTEM.

Sudden sharp stabbing pain in the precordial region, of pseudo-anginal type, was a common feature more especially during early convalescence. Fainting too was a fairly frequent symptom. Dyspnoea in any marked degree only occurred in association with some structural cardiac lesion. Neither endocarditis nor pericarditis was observed. With the prostration there was often great enfeeblement of the first cardiac sound, but this was soon recovered from as a rule.

The pulse-frequency was not always in proportion to the amount of fever. A slow pulse often accompanying a high temperature and vice versa in a lesser number of cases. Bradycardia was a fairly common feature after the acute fever had subsided. Forty beats per minute was noted in one case (case 19 McL.) and 46 in another (case 18 a) both on the third day. A condition of venous stasis in the skin



capillaries was frequently seen to follow on the intense erythema. Exceptionally this would seem to take the place of the secondary rash.

Scheube<sup>12</sup> mentions "severe precordial agony" Sandwith<sup>28</sup> met with one case of fatal Angina-pectoris "at the end of convalescence." Manson<sup>13</sup> puts endocarditis and pericarditis as possible complications. In Hare's<sup>20</sup> cases the pulse presented no striking peculiarity. Hirschfield<sup>20</sup> found bradycardia. He says - "it is characteristic of dengue that a relative bradycardia may be observed during the continuance of the fever and an absolute bradycardia frequently appears during convalescence."

(Read appendix Cases 35, 36, and 37) also Case 71.

#### IV RESPIRATORY SYSTEM.

Epistaxis occurred in 2 % of cases, chiefly among children and plethoric adults; and most frequently on the 2nd or 3rd day of the illness. The haemorrhages were usually slight. Bronchial catarrh with cough and expectoration - sometimes bloodstained - was present in 9% of cases, generally as a premonitory symptom, but occasionally developing during the attack. A mild form of acute bronchitis was met with in one or two instances as a complication. In persons predisposed to respiratory affections, the evidences of such often masked for a time the dengue symptoms.



Stedman<sup>1</sup> met with slight bronchial catarrh as a complication in one case. Skae<sup>4</sup> saw epistaxis in one case. Scheube<sup>12</sup> has increased nasal secretion, slight bronchitis, haemorrhages from nose, throat, larynx and bronchial tubes, as complications. Manson<sup>13</sup> mentions epistaxis and haemorrhage from the mouth. Matas<sup>16</sup> - epistaxis, coryza, bronchitis and pleurisy (rare.) Wordsworth<sup>27</sup> - epistaxis, Sanwith<sup>28</sup> - epistaxis (5 %).

(see Appendix Cases 38 and 39, also 10, 19 and 55.)

#### V INTEGUMENTARY SYSTEM.

The skin lesions, the chief of which have already been described (see 'Primary Rash' and 'Secondary Rash') come mainly under the heading 'NEUROSES', and may be grouped as follows:-

(1) Sensory disturbances - e.g. anaesthesia, hyperaesthesia, tingling, "pins and needles", formication, flushing, coldness - a feeling of cold down the spine - numbness, itching &c.

(2) Vasomotor and Nutritive Changes:- e.g. erythema of various forms - simple 'fugax', rubeoloid and E. Nodosum; purpura - punctae, petechiae, ecchymoses; urticaria; prurigo; localised oedema and pemphigoid bullae.

(3) Glandular affections - e.g. anidrosis, hyperidrosis, bromidrosis, sudamina, miliaria, "prickly heat" &c.



Among sequelae were - troublesome pruritis, oedema of hands, prickly heat, and, rarely, boils.

Matas<sup>16</sup> has inflammatory oedema of the face simulating erysipelas as a complication. Wordsworth<sup>27</sup> met with purpura, and sweating, sometimes with characteristic odour. Manson,<sup>13</sup> Scheube<sup>12</sup> and others mention boils.

(Read Appendix cases 40 to 43 and 48 to 51.)

#### VI URINARY SYSTEM.

Sometimes at the commencement of an attack the urine was increased in quantity and of pale colour. Later it became concentrated, dark, and frequently had a strong ammoniacal odour. Urates and triple phosphates were commonly deposited, and occasionally there were traces of bile pigment. Though many specimens were examined, in no instance was albumin found. This absence of albuminuria is one of the main diagnostic features of this disease as distinguished from the milder forms of yellow fever. That it is not always a reliable feature however would appear from the writings of Manson,<sup>13</sup> Scheube<sup>12</sup> and others, who maintain that albumen is sometimes present.

#### VII REPRODUCTIVE SYSTEM.

Testicular pain was a not infrequent symptom. It was generally of a neuralgic character. In only one instance was the disease complicated by an attack



of acute orchitis.

The usual date of onset of menstruation was sometimes anticipated by a few days when the fever was high, and the period might be prolonged somewhat during the attack. Three per cent of the whole number of cases were in pregnant women, but in no case was the pregnancy interrupted. One patient was confined at full term while suffering from the disease in the primary stage, and the child took dengue when five days old.

Scheube<sup>12</sup> notes testicular swelling, menorrhagia, frequent miscarriages and premature births among the complications. Manson<sup>13</sup> has orchitis and haemorrhage from the uterus. Wordsworth<sup>27</sup> found metrorrhagia, and Sandwith<sup>28</sup> prolonged and irregular menstruation.

(see Appendix Cases 24, 45, 45a, 46, 47, 49.)

#### VIII NERVOUS SYSTEM.

A mild form of peripheral neuritis lasting only for a few days, was met with in several instances. Weakness of the muscles in excess of that attributable to their temporary disuse was frequently complained of during early convalescence. Puffy oedema was common on the face and in the neighbourhood of joints. Absence of perspiration was the rule during the first two or three days, and subsequently the sweat often



had that sour penetrating odour so frequently associated with acute rheumatism. Hyperidrosis as an initial feature was rare. Considerable emaciation was sometimes observed; in one instance the body weight decreased by 12 lbs during the first four days of the illness. Anaemia as mentioned by Scheube was not a feature of my cases. Sleeplessness and great restlessness were almost invariably present at the beginning and dreaming was common. A greater or less degree of mental confusion attended the initial fever in almost every case, as evidenced by loss of memory, inability to concentrate the thoughts, slowness of cerebration &c. Active delirium sometimes occurred. It was more common in children. In them too, intense excitement sometimes prevailed, also convulsions, coma and in one case fatal meningitis with hyperpyrexia. Hallucinations and other hysterical symptoms were occasionally met with in adult females, and mental depression was comparatively common, and sometimes extreme.

Neuralgia, deafness, neurasthenia, and mental depression were among the sequelae. I have not met with any of the eye complications which Scheube mentions.

(see Appendix cases 48 to 58, also 6.)

Gibson<sup>2</sup> met with peripheral neuritis as a sequel. Sandwith<sup>23</sup> observed delirium, but only in the



intemperate and hysterical. Manson<sup>13</sup> puts hyperpyrexia as a possible complication.

#### IX LOCOMOTORY SYSTEM.

(see 'Pains and Headache' page 17 ) To this system belong the most important, because the most troublesome, sequelae. Joint pains of rheumatoid character, little amenable to treatment, often persisting for weeks or months, sometimes intermittent, most extreme in the mornings, or after rest, and not infrequently associated with effusion into or around one or more of the joints, were met with in about 5% of cases, chiefly in persons advanced in years, or of decidedly rheumatic diathesis. The tarsal joints, the ankles, knees, spine, wrists and finger joints were most frequently affected. The permanent ankylosis mentioned by some authors as resulting, I have not seen.

(Read cases 69, 70, 9, 14, 15, 18(Mr.S)38,43,51)

---



### DIFFERENTIAL DIAGNOSIS.

In many cases the onset simulated that of Acute Rheumatism, but, even in those rare instances when swelling of one or more joints occurred, the elusive character of the pains and the steady improvement in the general symptoms after the first twenty four hours, the rapid abatement of the fever and the absence of acid sweats - at all events until later - were usually enough to definitely exclude this disease within a day or two. Moreover Rheumatic Fever is comparatively rare here.

This last remark does not however apply to Malarial Fever, a still more frequent source of confusion. In general, non-periodicity, absence of splenic involvement, absence of the quinine reaction and failure to find the organism in the blood were sufficient to enable one to set aside malaria.

Certain cases resembled Influenza so closely that but for the presence of an epidemic it would have been impossible to distinguish them without recourse to bacteriological evidence. Usually, the severe pains, the comparative absence of bronchial symptoms, and the almost constant eruption were sufficiently exclusive. The question - Dengue or Influenza<sup>26</sup> ? gave rise to an animated discussion in the Academy of Medicine in Paris in 1889. Various authors - among them Cantlie<sup>34</sup> - have from time to time favoured



the idea that the two diseases are nearly akin or even identical.

The following points differentiate from Scarlet Fever:- (1) The early onset of severe pains (2) The evanescent character of the initial eruption. (3) The comparatively trifling throat symptoms, and finally (4) the appearance of the secondary rash. A point of local importance is that Scarlatina is unknown here.

Doubts appear to have been entertained as to the true nature of some sixty cases admitted as Scarlatina to the English Military Hospital at Cairo, during an epidemic of Dengue there in 1887.<sup>28</sup>

The question of measles v. Dengue only arose in connection with those few cases chiefly in children in which a measly rash appeared without a definite history of previous pains. The absence of nasal and bronchial catarrh, the fact that the rash generally began on the arms scarcely ever on the face which was comparatively rarely affected, that the individual spots were seldom distinctly crescentic, and that on an average they disappeared within 48 hours without leaving a trace behind, were all in favour of dengue.

The more severe nature of the illness with nephritis, jaundice and 'black vomit' readily distinguishes typical cases of Yellow Fever, but there would appear to be a border-land where mild cases of this disease meet with dengue cases in which slight albuminuria, jaundice or haematemesis may lead to



confusion when the two diseases coexist, as has happened in more than one district.

Dr West<sup>N</sup> Texas is reported to have come to the conclusion that dengue and mild yellow fever could not be differentiated and that the two might exist together. The only differential point between the two that he was able to recognise, is the occurrence in Yellow Fever only of severe nephritis with albumin and casts in quantity.

Yellow Fever is not known to have visited this island.



PATHOLOGY and MORBID ANATOMY.

The dengue pathology is still merely speculative. The disease toxine appears to act primarily on the nervous system.

I have no personal acquaintance with its morbid anatomy, but the following post-mortem conditions have been met with from time to time by various observers:- Hyperaemia of the cerebral meninges; sero-purulent exudation into the pia-mater; serous effusion into certain joints, and into the pericardium; pulmonary congestion, and myocardial softening.

---



P R O G N O S I S.

Among my 1,100 cases there were two deaths, already referred to (see Appendix. Cases 56a and 71.) equal to a deathrate of slightly under .2%. Prognosis is least favourable at the extremes of life.

Neither Stedman<sup>1</sup> nor Pridmore<sup>5</sup> saw nor heard of any fatal case. Anderson<sup>y</sup> heard of one old man who "seems to have succumbed" to the disease. Sandwith<sup>28</sup> knows of no fatal result in Egypt, with the exception of one case of "malignant dengue" at Port-Said in 1883, in which the terminal symptoms were drowsiness with dilated pupils on the seventh day, gradually passing into coma and death. He also says that "one patient died of angina pectoris at the end of his convalescent period". Skottowe<sup>24</sup> had no fatal cases. There were 12 deaths in 100,000 cases in Smyrna (Lancet, Vol.I.1890) Among 1500 cases in Hawaii<sup>6</sup> no deaths occurred. Manson<sup>13</sup> puts the mortality at "about .1%". Matas<sup>16</sup>, on various authorities, at from .1% to .6%. Scheube<sup>12</sup> says that in the severest epidemics the mortality does not exceed 1%.

---



## T R E A T M E N T.

1. PREVENTIVE:- There are many thousands of "natives" here - the bulk of them Chinese - who never seek trained medical help under any circumstances whatsoever. Hence, it will be readily understood, that, with a disease like dengue, general prophylaxis is utterly impracticable.

"Home isolation" and disinfection should however be carried out as far as possible. The young, the weak, and the old should be specially protected from exposure to infection. During an epidemic a change of residence to an elevated locality offers the best chance of escaping the disease. Medical men should be fully alive to the possibility of the infection being conveyed by themselves from one patient to another.

II As to General Treatment, complete rest for a week should be enjoined - and even insisted upon in cases shewing symptoms of distinct cardiac weakness - with light but nourishing diet. Alcoholic stimulants are not usually called for.

III. Medicinal:- This is entirely symptomatic, and directed mainly towards the relief of the pains and headache, the reduction of the fever, the



procuring of sleep, and the promoting of perspiration. A combination of quinine sulphate and phenacetin, in powder (gr.V and gr. VIII respectively, every four hours) seemed to give the best results. Whether the comparative freedom from "relapses" enjoyed by my patients, was in any way due to this treatment, is an interesting question. Sodium Salicylate (gr XX every four hours) was also good in the severe pains. Likewise Salicine in similar doses. Opium or morphine was seldom required; and when indicated Dover's powder (gr.X - gr XV at night) generally met the conditions. I never found it necessary to resort to morphine hypodermically for the pains, since these were greatly mitigated by a studied avoidance of all active movement. In extreme restlessness the bromides were useful. The more active hypnotics were avoided as far as possible, but both trional and sulphonal were occasionally employed with advantage. The severity of the pains contraindicated the use of purgatives and emetics in most cases, even if there was any special advantage to be derived from their employment.

IV. During Canvalescence - Tonics like Easton's Syrup, good food, with wine or stout, avoidance of over-exertion, precautions against the effects of sudden changes of temperature; and, in the worst cases, change of air and scene, or a sea-voyage,



constituted the treatment.

For the persistent joint pains &c. liniments, warm baths, massage or electricity, with quinine, arsenic, iron or potassium iodide internally, were of benefit.

---



## A P P E N D I X

of

I L L U S T R A T I V E C A S E S.I. SOME EARLY CASES

## CASE 1. - Diagnosed as malaria.

Mrs H. aged 40, European, several years resident, was seen by me on 18th August 1901, at the request of another practitioner. Her leading symptoms were severe headache, pains all over the body, vomiting and moderately high fever. Malaria had been diagnosed, and she was being given quinine, but without distinct reaction. There was no previous history of malaria. No blood examination was made. Subsequent progress conformed in every respect to that of later dengue cases.

---

## CASE 2. - Undiagnosed.

T.L. a chinese clerk, aged 19, was visited by me on August 24th 1901. He shewed a somewhat general roseolar eruption, of discrete, rounded, dusky spots, most marked on the limbs, but likewise involving the chest, and, to a less extent, the face, disappearing on pressure. There was no history of



specific disease, nor had he been taking drugs; but he said he had had fever and slight pains in the joints three or four days previously. Thirty-six hours after my visit he was back at work, quite well, and free from rash.

---

#### CASE 3 - A puzzling case.

Mrs Y.T. an Eurasian, about 30, gave a somewhat similar history to the last when I saw her on Aug.. 27th 1901, and she shewed a general pruriginous dermatitis with intense itching, of twenty four hours duration. She further complained of sleeplessness, want of appetite and great weakness. She had had diarrhoea following the fever, and for this another medical man had treated her. No diagnosis had been arrived at. Menstruation had always been normal.

---

#### CASE 4. - With dysenteric features.

I saw Mrs H's child aged 2 years, on September 8th 1901. He had had fever for two or three days, cried a good deal on being handled, and was sleepless and restless. On the day previous to my visit diarrhoea had come on - frequent slimy motions mixed with a little blood - and a papular rash had developed all over the body. The temperature was slightly raised at the time of my visit.



In the face of the commencing epidemic, the rapidity with which the symptoms yielded to treatment removed all uncertainty as to the true nature of the case.

---

CASE 5. - Simulating Typhoid.

Mrs C.T.K. a chinawoman was visited by me on 28th September 1901 and found to be suffering from fever, headache, backache, and diarrhoea of two to three days duration. She had been seen by another practitioner who pronounced her case to be typhoid. The fever and other symptoms had disappeared in a day or two, and the subsequent progress pointed conclusively to dengue.

---

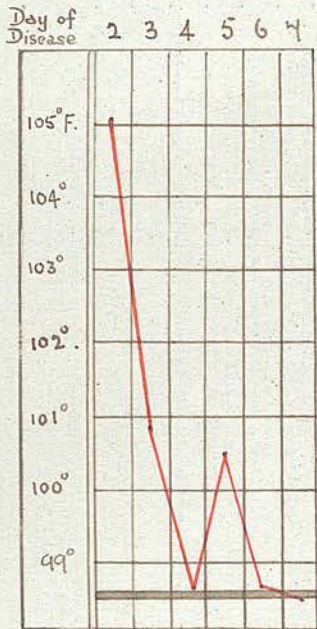
CASE 6. - Grave symptoms.

Mrs C's child, European, one of twins, 6 months old, developed a high temperature and a vesicular eruption on 24th October 1901. Another medical man, who kindly saw the case in my absence, diagnosed chickenpox.

The following conditions were present on my visit next day:- Flushed face, half-closed eyelids, quickened respiration, semi-coma, a temperature of 105° F. and a very rapid pulse. There was no history



of convulsions, but of occasional vomiting, great restlessness and sleeplessness. The lower limbs shewed a discrete, reddish, papular eruption, with about half a dozen scattered pemphigoid bullae the



Temperature Chart. Mrs. C's child

size of a split pea; also a purplish patch the size of a florin, and resembling a recent bruise, over the front of the left tibia. The trunk and face were free from eruption. The skin was "pungent".

On the third day of the illness the temperature was 100.8 F, the coma had gone, and the child was crying.

By the fourth day the temperature had reached normal, and the skin lesions had all but disappeared. A secondary rash of maculo-papular type appeared on chest, arms and hands, on the fifth day, with a temperature of 100.5° F. and on the following morning, swollen tender, lymphatic glands were discovered posterior to both sterno-mastoids. The temperature was again normal. Recovery was rapid.



II. CASES ILLUSTRATIVE of VARIOUS POINTS  
in the ETIOLOGY.

CASE 7. - Labour as a predisposing factor.

Mrs C. European, primipara, was confined on the early morning of 18th Octr 1901. Labour was natural but somewhat prolonged. She complained on the same evening, of headache, nausea, pains in wrists, calves and back. The temperature was 101.2° F.

She passed a restless night, and on the following morning was somewhat listless, with temperature 101.5° F. This however fell to 99.5° F. in the evening and next morning to normal, with disappearance of the pains &c.

She remained well until the 22nd (i.e. the fourth day), when there was some return of the pains, and the temperature rose to 100° F. She was "not so well today". On the 23rd she shewed a profuse rash of measly type all over the body - least marked on the face - with a temperature of 102.4° F. She was said to have had a rigor on the previous evening.

On the 24th the rash was all but gone, and next day she was quite recovered. The discharges remained normal all through, and she left her bed on the tenth day.

There were at least three other cases in the same house, including the infant - five days old (see cases 12, 13, 14).



## CASE 8. - Accident precipitating an attack.

Mr A. Scotchman, about 35, while pursuing a refractory coolie on 30th Octr 1901, fell and sprained his wrist. On the following morning, after a restless, sleepless night, he shewed well marked dengue symptoms, viz, severe headache, pains and stiffness in lower limbs and back, flushed, puffy face, with injected conjunctivae, a primary rash of patchy erythema on face and chest, dirty tongue, nausea and vomiting, and a temperature of 101.8° F., which had been 103° F. some hours previously.

Thereafter the illness ran an ordinary course.

---

CASE 9. - Over-exertion promptly followed by a seizure.

C.D. aged 40, a former Straits athlete, 17 years in the East, cycled 54 miles on 8th Decr. 1901, and had "shivers" that same night, and couldn't sleep. Next morning he limped and crawled on to the verandah, evidently suffering great pain in locomotion. He had a most lugubrious look, and declared that he "felt fifty times worse" than he had ever done "after a first-for-the-season Rugby match". In addition to severe headache and nausea, there was great pain on movement in feet, ankles, back, wrists, and terminal



joint of left little finger. The pain was especially severe on getting up from the recumbent posture. Later in the day he required help to sit up. He ruefully attributed his distressful condition to the long bicycle ride in the sun.

As to general symptoms:- Face was flushed, and conjunctivae injected; tongue furred, with red edges and tip; expectoration excessive - "mouth keeps filling up"; appetite entirely gone; skin hot and dry, and shewing "prickly heat" of long standing; urine high coloured, strong smelling, but free from albumin; taste perverted and sustained mental effort impossible: Temperature 102.4° F.

Notes of subsequent progress:- (see temperature chart No 1 page 20)

10.12.01 - Passed another sleepless night, but movements less painful: Stale odour of perspiration: Headache very severe, also pain in eyeballs on movement.

11.12.01 - "much better": Slept well, but had another "shivering" towards morning: Locomotion much easier: Nausea and anorexia remain.

12.12.01 - Insisted upon going to Office this forenoon, but was forced to return towards mid-day: suspicious dusky-red mottling on hands and forearms this evening.

13.12.01 - "Bowled over" again: Pains and headache almost as severe as at first, also the



stomach symptoms; Distinct rash on hands and arms, less marked on chest: "Boiled-lobster" appearance of face with swelling of upper eyelids; General skin surface congested; Tenderness over nose; Hands swollen and prickling; Left posterior auricular gland enlarged and tender; spirits depressed; "weak".

14.12.01 - General condition much improved again; Temperature normal, but joints very stiff and painful on movement especially the ankles and tarsal joints: Severe backache: Rash fading and giving place to a bluish mottling on thighs.

From this time he gained in strength daily, but convalescence was greatly protracted on account of the joint pains. For days he could not walk without the help of a stick, and on going down-stairs he had to cling to the bannisters while each step evoked a groan. It was fully two months before the pains finally disappeared.

---

CASE 10. - An attack following prolonged exposure to the sun.

Mr R. a Jew, aged 21, was much exposed to the sun on Octr 6th 1901, and next morning he had headache, fever, "aching in the chest", all of which symptoms became so aggravated by 3 p.m., that he was forced to give up work - he was a telephone operator - and take to bed.



I visited him on the morning of the 8th. He then shewed flushed face and scarlatina-like rash on front of chest. Conjunctivae were much injected, tongue furred, temperature 103° F. and pulse 100. He complained of "bad taste", poor appetite, constipation, sleeplessness, restlessness, giddiness, frontal headache and pains in the precordial region, thighs and hips. Liver and spleen were unaffected. Skin was hot and dry. There were no cardiac nor respiratory symptoms, and no albuminuria. He walked with difficulty and great pain.

(see Chart No. 2 page 20 )

Next day he coughed up some streaks of blood which he shewed me on a handkerchief. The throat was congested. He again complained of sleeplessness: Pains only slightly less severe than on previous day, but temperature normal. On the 10th an enlarged tender gland was felt in left groin, femoral group; but generally, he was much improved. On the 11th he again complained of sleeplessness. A distinct, dusky-red, macular rash shewed on arms and chest on the 12th, and was accompanied by a temperature of 102° F., and some increase of the joint pains, and of the gastric symptoms; also by giddiness and faintness on sitting up. On the following day the rash was more profuse and general, but fading on the parts first affected. He expressed himself as much improved. He got out of



bed on the 14th, and, though then very weak and with a rapid dichrotic pulse, he improved so quickly as to be able to resume his work on the 17th.

---

CASE 11. Tracing the infection. A recurrence. For some days prior to Sept 8th 1901, I had not, so far as known to me, come in contact with a dengue case. On that date I visited three; one, a child in the secondary stage with rash, the other two, adults, living in the same house, one in the acute stage (1st day), and to all appearance infected by the other, who shewed the secondary rash (5th day). I again visited the acute case on the morning of the 9th, but did not come into such close contact with him, as on the previous day. Between this last date and the commencement of my own illness there was no further exposure. On the evening of the 11th I began to suffer from headache, with slight fever, weariness, anorexia and general stiffness in joints and muscles. At 1.30 a.m. of the 12th, I woke up with a chilly feeling - though the skin was "burning", hot - increased temporal headache, and pains in the tarsal joints on movement. The remainder of the night was sleepless and restless. It was impossible to secure a comfortable position to lie in, because of aching in bones and joints, particularly the femorae and the knees. I got up at 6 a.m. tired and unrefreshed, and with



symptoms aggravated by lumbago-like pains in the back. The eyeballs pained on movement too, and I felt as one does after violent exercise when out of form, and at the first essay, walked like an old man crippled with chronic rheumatism. The temperature was 102° F. pulse 98.

By the evening, the following general symptoms were well developed:- flushed, swollen, 'burning' face with injected conjunctivae; white tongue with red edges; congested buccal mucous membrane; slight sore throat; thirst; "weight" at pit of stomach, nausea and constipation; "pungent" skin, with general cutaneous flush, and swollen "tingling" hands, high-coloured concentrated urine with strong odour but no albumin; impaired taste; inability to concentrate the attention; locomotory symptoms as above, with, in addition, pain on movement of fingers, shoulders, and right knee, a feeling as of a sprain in left-wrist, and occasional "lightning" pains in calves and elsewhere.

Subsequent progress. (see Chart No 3 page 20).

13.9.01 - Passed a sleepless night: Weak, but pains less; Prickly heat rash in front of chest and abdomen.

14.9.01 - Gastric symptoms more pronounced than ever - increased nausea at sight of food, complete



anorexia, dirty brown tongue and almost total absence of sense of taste: Sharp shooting pain in calves, nearly causing a fall on going down-stairs: Rash spreading and assuming more of measly type, with itching: Morning temperature normal.

15.9.01 - Slept well during the night for the first time since illness began: Still weak and depressed however: Skin beginning to act: Rash profuse, general, measly - large, irregularly rounded, not markedly crescentic spots, thickly aggregated: Increased pain behind the eyes, and in the tarsal joints on walking.

16.9.01 - Rash gone from extremities.

17.9.01 - Much improved: Pains gone: In better spirits: Better appetite: Hands still swollen, red and "prickling": Elsewhere rash has disappeared.

From this date improvement was rapid and uninterrupted. The hands resumed their normal state in two or three days, but for quite a month, the tarsal joints ached severely after any extra exertion, and at intervals there were sudden momentary lancinating pains in the precordial region, in the calf muscles, and elsewhere.

The second attack occurred after prolonged exposure to the sun while out shooting on 18th May 1902 - interval between attack, 8 months. The first symptom was pain on movement of the lower jaw on the



19th. At first the left tempero-maxillary joint only was affected, but within a few hours, both became so painful, that it was impossible to eat solid food. This pain disappeared after twenty-four hours. Then followed langour, thirst, headache, loss of appetite, and aching in muscles and joints on the 20th. Sleeplessness, increased headache, and pain in the tarsal joints with fever, and a primary roseolar rash on hands and forearms, which remained out a few hours only, on the 21st. There were also stiff-neck, frequent stabbing pain in left ear, and pain in eye-balls, on this date. The other symptoms were similar to those of the previous attack. The secondary rash appeared on the 25th, at first on the hands, and next day all over the body. It was of papulo-macular type - dusky-red spots, coalescing at parts, and affecting the extensor aspects of the limbs more than the flexor. Convalescence was rapid, and there were no sequelae.

---

#### CASE 12. Dengue in an infant.

Mrs C's baby (see Case 7 page 57 ), nursed by the mother while the latter was suffering from dengue, had the following symptoms when five days old:- sleeplessness, restlessness, rapid breathing, temperature 103 F. and dry flushed skin. He cried on being handled. Next day the temperature was 103.4 F.,



but on the third day it fell to normal, and he slept, and afterwards seemed better. On this evening however, a few isolated pemphigoid bullae appeared on the lower limbs and head, each bleb about the size of a split pea, tense, with watery contents, and a slight red areola. For the next few days fresh bullae appeared, while the older ones subsided; but by the end of a week the child was quite well again.

---

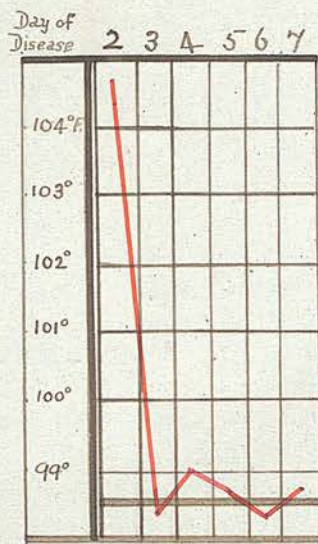
#### CASE 13. The disease in a nervous girl.

##### Crisis.

Miss H. aged 12 years, in same house as last case, three weeks returned from England, complained of sudden onset of severe pains in wrists, left shoulder and back, on the morning of 21st Octr 1901 - about three days after her sister Mrs C's attack (see Case 7). She had mentioned feeling a slight pain in the shoulder on the previous evening.

The face was flushed, expression tearful, tongue furred, breath foul. Other symptoms were loss of appetite, absence of taste in the mouth, temperature 104.6° F, a cant-be-bothered air, and hot, 'burning' skin. She had slept badly, was too ill to sit up, and cried on being obliged to move in bed. Eighteen hours later she was running about "quite well", with temperature slightly subnormal, but with flushed face and foul tongue.





Temperature Chart. Miss H.

23.10.01 - Less lively:

Diarrhoea.

24.10.01 - "Better again":

Tongue cleaning: Appetite improving.

25.10.01 - Pinkish spots on palms, size of pea.

26.10.01 - Rash all over upper and lower limbs - isolated rounded pink maculae:

Otherwise quite recovered. She is flying a kite.

#### CASE 14. - An oldish patient. Sequelae.

Mrs H. aged 56, mother of last case, a long-time resident, but fresh from a visit to Europe, a healthy subject, had sudden onset of severe pains with vomiting on the evening of 23rd Octr. 1901. Next day, when I saw her, she was evidently in great distress, groaning with pain on every movement, and too ill to leave her bed. The usual headache, gastric symptoms with vomiting, and sleeplessness were complained of, and the fever was moderately high. On the following day she was considerably better, but the joint and muscle pains caused great inconvenience and discomfort, and, though otherwise the illness ran an ordinary course, with a miliarial rash on the fifth day, the pains persisted, and for fully three months afterwards,



interfered more or less with her movements. There were no joint swellings.

---

CASE 15 - Malaria as a sequel.

W.A.McK. aged 35, civil engineer, was taken ill on 22nd Octr 1901, with severe headache, pains in the joints, and fever. He was seen by me next day.

History:- He had had measles as a boy, and several attacks of malarial fever since coming to the East, a few years ago; but "never before experienced such pains". Sleep had been much disturbed by dreams on the previous night. His face is flushed and puffy; tongue furred; temperature 102.4° F; pulse 94. There is "bad taste", no appetite, thirst, nausea - he vomited once -, and constipation. There is no enlargement of liver or spleen: Skin is moist. There are pains in the frontal region, back of neck, back, wrists and feet - one great toe especially. These are worst on movement. There is slight puffy oedema on the inner aspect of right knee joint, with increased heat and tenderness to touch there. He cant walk erect, but crawls along with support from the furniture.

24.10.01 - "Better, but weak". Still stiff and sore on movement: Strong sour odour of perspiration.

25.10.01 - Temperature normal: Giddiness on walking: Knee swelling gone.



26.10.01 - "Weak and useless", but free from pains:  
General maculo-papular rash shewing.

He made a rapid recovery. On Novr 3rd following, he complained of "rheumatism" in the right knee. There was no swelling. On the 18th of the same month he had a severe malarial attack with vomiting and a temperature of 106° F. This yielded in a few hours to large doses of quinine, and next day he was well, but weak.

---

#### CASE 16. A Recurrence.

Mr G. aged 22; three months in the East, complained of weakness, backache, pains in back of head and in one wrist, on 24th Octr 1901. The illness began two days previously with alternate hot and cold feelings, and pains in the joints generally.

Present symptoms:- furred, slightly swollen tongue; foul breath; nausea; anorexia; sleeplessness; giddiness; pains in the heels - region of tendo-Achilles - on walking; flushed face; injected conjunctivae; dry burning skin, and a temperature of 101.2 F.

26.10.01 - Rash of measly type, and general distribution - the face is one huge red blotch, and feels very hot and burning; both to sensation and to touch. In other parts too, there are huge erythematous



patches, two or three inches in diameter. Pretty, pink macules shew on the palms, under the epidermis. There are enlarged glands in the groins, posterior to both Sterno-Mastoids, and below the right ear (parotid region). The temperature declined by lysis, reaching normal on the 6th day. (see Chart 7 page 20). By the 8th day he was back at work, in good health.

In June 1902 I was called in to see Mr G. whose then medical attendant - a few days out from England - was in some doubt as to the nature of a rash which his patient had developed. This was somewhat similar in character to that described above, only less profuse and without the large patches. From the history and the general condition of the patient, I concluded that it was the rash of dengue, and the subsequent course confirmed the diagnosis.

---

CASE 17. Three attacks in fifteen months. Mr L. aged 28, two years in the East, came on 28th Octr 1901 complaining of "pain in the neck", both on swallowing and to touch, in the position of the crico-thyroid articulation. He "couldn't swallow tiffin". The pain began on the previous day - slight at first - with stiffness in the limbs. He had had headache for the last two or three days. Six months previously he had contracted syphilis, and had come



to me with well-marked rash and other "secondaries". He is still under treatment for this complaint.

General facts:- Temperature  $101^{\circ}$  F: Pulse 100. Dorsum of tongue, thickly coated with yellow fur, shews one small, greyish, wash-leather patch on the tip. The gums are slightly purplish, but not tender. The throat is congested, and there is slight follicular tonsillitis with swelling and tenderness outside the jaw. There is no appetite: Skin is hot and dry; urine healthy.

29.10.01 - Temperature  $102^{\circ}$  F., pulse 96; Tongue very foul, and breath smelling badly: Fingers stiff, and legs weak: Slight deafness: Vomiting in the night and sleeplessness.

30.10.01 - Pain in neck quite gone: Occasional shooting pains in lower limbs.

1.11.01 - Profuse maculo-papular rash chiefly on arms and hands, and to a less extent on the face, confluent on the elbows: Sudaminal vesicles mixed with the rash: Temperature  $99^{\circ}$  F.: Throat better: Tongue ulcer has yielded to  $\text{AgNO}_3$ : Slight swelling and tenderness of glands posterior to the right sterno-Mastoid.

In a day or two the rash and other symptoms had disappeared, and the convalescence was rapid. The mercurial treatment had been suspended meanwhile, and quinine, phenacetin and tonics given.



Seven and a half months later (12th June 1902), he again shewed a rash over chest, back and arms - macular underneath the palmar epidermis, elsewhere more papular. The temperature was 100.5 F, and he gave a history of illness dating from the 8th, with pains and stiffness on walking, fever and other dengue symptoms. He made a rapid recovery.

Once again, on January 21st 1903, he appeared, and presented a rash similar in type to the last, but limited in distribution to the hands and forearms. There were also enlarged and tender glands posterior to the Sterno-Mastoids. The temperature was normal. This time the general symptoms had been less marked. He was merely "a bit out of sorts" for a few days previously. The appropriate treatment for the specific condition had been persisted with between the attacks.

---

CASE 18. - A Family Party. Doubtful 10 days incubation.

Mrs S, her husband, and two Chinese servants comprised the household. Each in turn suffered from dengue - first the cook, three days later the house boy, and, after another similar interval, Mr S.; but though Mrs S. nursed her husband, occupying the same room, and indeed the same bed, it was 10 days from the commencement of his illness, and three days after



desquamation had set in, before she shewed signs of the disease.

The husband's case presented some interesting features, e.g.

(a) Fulminant onset:- He was taken ill so suddenly, with extreme pains in the joints and back, while at work, on the forenoon of 30th Sept 1901, that he had to be conveyed home, being unable to walk the 200 yards distance. About noon I received an urgent call to see him; and found a stout, plethoric subject, of alcoholic habit, in great distress, suffering excessive pain on the slightest movement, and with a temperature of  $104^{\circ}$  F. He had merely felt "a bit stiff" in the morning.

(b) Profuse perspiration:- From the onset, he perspired so freely as to necessitate frequent changes of garments and of the bed clothes. The perspiration was sour-smelling. His temperature declined by gradual lysis to normal on the third day.

(c) Early appearance of the rash:- This shewed on the third day, on the chest, and resembled rōtheln. Later, it became more measly, and covered the whole body. It remained four days. Desquamation followed on the 7th day - fine branny scales on hands and bends of elbows.

(d) Sequelae - The right knee was specially painful all through, and for several days after convalescence set in; and swelling of the right ankle,



in front of the tendo-Achilles externally, with pain on movement, was observed on the 10th day. This quickly disappeared. For quite a month however, occasional, sharp, momentary pains occurred on certain movements, in the right shoulder and in the knees. The lower limbs were often stiff in the morning, and after resting, and, sometimes, a temporary numbness in the feet was experienced.

Mrs S. was likewise fat and phlegmatic, and aged 42. She took ill as already indicated on Octr 9th, with chilly feelings, and a more gradual onset of pains, which however became very severe indeed later on, so much so, that for some hours she couldn't turn in bed, and even breathing was painful. Her illness was fairly typical of ordinary cases (see Chart 4 page 20). She had the usual bloated appearance, severe headache, gastric catarrh, sleeplessness &c, with pains in back, wrists, ankle and tarsal joints, stiff-neck and absence of perspiration. On the second day she complained too of pains in the jaws, and the teeth felt loose; also of "tingling" in the hands. The rash appeared on the 5th day, with "chills", and a temperature of 99°.5 F. It likewise was of measly type, but less general than in the husband's case. Recovery was somewhat impeded by a weak heart, but she eventually regained her normal health. Unfortunately, however, she contracted



typhoid in January 1903, and died in the third week of the illness, from cardiac failure.

---

CASE 18a - A short incubation period.

Mr C. aged 21, a few weeks up from Australia, had not previously had dengue. He invited a friend to spend the evening of 27th February 1904 at his mess. The friend came but left early, because suffering from fever and pains of rapidly increasing severity, which his doctor had that afternoon told him were due to dengue. (N.B. - This diagnosis was confirmed later in hospital, by the appearance of a profuse rash &c).

On the following morning I was called to Mr C. who had had repeated vomiting since waking up at 7 a.m. Nothing would remain on his stomach, even a sip of cold water was immediately rejected with much retching. He had been quite well on the previous evening, and his food had been what he was accustomed to, and what the others in the house had partaken of. He was a total abstainer from alcohol.

In addition to the vomiting, he complained of severe headache and pain in the back. His face was flushed, with blood-shot, watery eyes. There was considerable prostration. The bowels were constipated: The temperature 101.5° F.



The treatment was directed towards stopping the vomiting, and complete rest was enjoined. I saw him again on the following morning. He had had a sleepless night, but the vomiting had ceased, Temperature was 100.8 F. pulse 76. He was "comfortable". The bowels had not moved. On the third day the temperature was 99° F. pulse 46. He said he was "all right" as long as he lay in bed, but "felt giddy and weak on getting up." The headache and backache had completely gone.

He continued to improve. On the fifth day a slight herpetic eruption broke out on the lips and alae of the nose. There were also a few papules inside the mouth, and the tongue was foul. He still complained of giddiness on walking, and of want of appetite. There was distinct redness over the knees and elbows but no further signs of secondary rash were detected up till the morning of the 6th day.

---

CASE 19. - Possible infection by articles of clothing.

Messrs C.J. and McL. messed together. C. and J. slept in separate beds in the same small room. McL. had a bedroom to himself. C. contracted dengue on 1st Octr 1901, the main features in his case being high initial temperature (104° F), with pulse 94; bronchial catarrh, critical diarrhoea; rash on the



5th day; and, as sequelae, supraorbital neuralgia, and occasional precordial pains.

J. took ill on Octr 4th. His was a comparatively mild case, but characterised by diarrhoea, enlarged glands, rash on the 5th day, slight tenosynovitis (left tendo-Achilles), tingling in hands and feet, and desquamation on the 9th.

McL. complained on the 12th of moderately severe symptoms - the joint pains and sleeplessness being especially trying for two or three days. There was also vomiting. The temperature reached 102.8° F. on the second day. On the third the pulse rate was 40 per minute. The rash appeared on the 5th day.

---

CASE 20 - Absence of rash: A plethoric subject.

Mr B. aged 40, stout and strong, took ill on 10th Octr 1901, suddenly, with severe headache, and pains all over, but especially in feet and hands. I saw him next day. He had "had a bad night." The "boiled-lobster" appearance was marked. There was a "white strawberry" tongue and a temperature of 101.5° F. He complained of loss of appetite, nausea and vomiting, with streaks of blood in the vomit. The blood came from a congested throat. There was also thirst, pain and weakness in the wrist, knees and ankles, with frequent muscular shooting pains.

(see Chart 9 page 20)



12.10.01 - "Slightly improved." He called attention to the strong smell from the urine. Hands slightly swollen: Streaks of blood in stool; no piles.

13.10.01 - much improved after a good night:

14.10.01 - Improving rapidly: Pains gone.

No secondary rash was observed. Another Mr B. (no relation) in the same house had dengue from Octr 13th. He shewed a rash on the fifth day.

#### CASE 21. - Change of type.

Mr P. aged 30, a new-comer, complained of headache and malaise on 27th June 1903. There was general stiffness in joints and muscles, also disinclination for exertion of any sort, loss of appetite, and marked restlessness and sleeplessness. The temperature was 101 F. Bowels were constipated: No enlargement of spleen: Other systems healthy.



Temperature Chart. Mr. P.

Next day he was no better, and he remained in this state for five days, "always worse at night". Quinine had no effect on the temperature, which did not reach normal until the seventh day,



after which date he began to improve, and in two or three days was quite well again, and back at work. Beyond some initial congestion of the face and front of chest, no rash was observed.

---

CASE 22. - A sequel to the last.

Mr B. three weeks in the East, aged 22, and living in the same house as Case 21, took ill on the evening of 13th July 1903 after playing football. His chief symptom was severe headache. I saw him on the 15th, when he still complained of headache, and of having vomited during the previous night. His temperature was then 101.6° F, his face flushed. Photophobia was marked. Other symptoms were furred tongue, "bad taste", and a sour odour of perspiration. No complaint of muscle or joint pain was made until the following morning, when he said he felt a deepseated aching in the right hip. This was gone next day, and he was 'comfortable', though the temperature was still 100.5° F. (see Chart 8 page 20) This rose still higher on the fifth day, and a papular rash interspersed with sudamina appeared on the chest. The bowels, at first constipated, were regular after the third day. By the sixth day the rash had spread slightly on to the face. He left his bed on the 7th day with normal temperature and feeling weak, but otherwise well. Three days later he returned to work.



CASE 23. - Dengue in a small-pox district. E.H.G's son aged 14 years, Chinese, was seen by me on 1st Octr 1902. He lived in a neighbourhood where, in the writer's own practice, two cases of smallpox - one of them confluent and fatal - had recently occurred. His vaccination marks were indistinct, and his symptoms were sudden onset of 'chills', severe headache, pains in the back, nausea, restlessness, a scarlatina-like flush over chest and face, a temperature of 102.5° F, and great distress.

---

### III "SYSTEM" CASES.

#### (a) Alimentary System.

#### CASE 24. Dengue: Ptyalism.

Mr J. aet. 20, an Eurasian clerk, had severe joint and muscle pains, headache, pain in right testicle, "prickling" in tips of fingers, loss of appetite, bad taste in mouth, nausea, constipation, excessive expectoration, a temperature of 101° F, and pulse 100, on 28th Octr 1901. There was also flushed face, injected conjunctivae, furred tongue, congested buccal mucous membrane, with, next day, swollen, tender, left submaxillary gland. In the course of the third day he expectorated two quarts of clear watery fluid, had ten peasoupy motions, and vomited six or seven times. On the fourth day the above



symptoms had largely disappeared, but there were; enlarged tender glands behind the right Sterno-mastoid. On the sixth day there was a papular rash, with great itching, and further glandular enlargement in groins and axillae. Thereafter recovery was rapid and complete. He had not been taking mercury. (see Chart 5 page 20).

---

CASE 25. Dengue: Ulcerative Stomatitis.

R.W.L. 31. Eurasian, complained on 10th Octr 1901 of the usual dengue symptoms, viz.- 'Chills', headache, shifting pains, stiff-neck, fever, sleeplessness, loss of appetite, flatulence, feeling of weight at pit of stomach, thirst &c. There was also diarrhoea.

Examination of the mouth shewed a somewhat swollen furred tongue, inflamed mucous membrane, and purplish gums which bled easily. The right sub-maxillary gland was enlarged and tender. Temperature was 103 F. \*There was no albuminuria, and no drugs were being taken. Three days later several small ulcers were seen at the margin of the gums - lower jaw. The breath was foul; the buccal secretion increased.

Fifth day - Purplish macular rash with rise of temperature, return of pains, and slight swelling with pain on movement over right tendo-Achilles: Increase in size of gum ulcers to  $\frac{3}{4}$  inch in longest



diameter, with wash-leather appearance and inflamed margins. These yielded to treatment with chlorate of potash in a few days.

---

CASE 25a. Dengue:- Ulcerative Stomatitis.

Mrs N's cook, a Chinaman, was seen by me on Octr 17th 1901, when he shewed a profuse measly secondary rash all over the body including the face; also a severe stomatitis, with much swelling of the buccal mucous membrane and of the tongue, which was thickly coated with dirty brown fur; increased salivation and numerous ulcers on gums, tongue and insides of lips and cheeks. The ulcers varied in size from a pea to a lentil, had a greyish-white covering, underneath which was a red-raw surface discharging a small amount of pus. The gums were tender and bled easily, and the breath gave off a most offensive odour. He had complained some days previously of pains and fever. The condition cleared up in a few days under appropriate treatment.

There were at least two other cases in this house at the time (see Cases 31 and 46).

---

CASE 26. Dengue: Tonsillitis.

G.N.P. aged 40, a Scot, took ill on 21st Octr 1901, with nausea, giddiness, headache, pain in tarsal



joints, and in metacarpo-phalangeal joints of both forefingers. He shewed a primary, roseolar rash, most marked on brow and temples, with flushed face and injected conjunctivae; besides the ordinary buccal and gastric symptoms. The temperature was 101 F.

Two or three nights of disturbed sleep followed - dreaming, with diarrhoea, tender mouth, sore throat, some tonsillar swelling, and slight deafness, on the third day. The swelling of the tonsils was increased on the fourth day, with yellowish exudation in the crypts. There was more pain on swallowing too.

On the fifth day a rash appeared. At the end of ten days he was quite well again. His two children and their nurse all suffered from the disease about this time.

---

CASE 27. - Dengue: Severe gastro-intestinal symptoms.

Mr McM, 25, clerk, was seized with severe headache, pain in the right wrist, and stiff-neck on 2nd Novr 1901. Pains in the ankles and back followed later. Next day there was severe and repeated vomiting - the stomach would retain nothing -; also frequent diarrhoea - the repeated necessity for getting out of bed causing a great deal of pain. Cough was also present. The dengue facies was well marked, and



there was pain and tenderness to touch over both parotids, with slight sore throat. There were also occasional pains in the precordial region, and the eyeballs ached excessively on movement. Temperature was 104° F.

By the third day these symptoms had greatly abated; the stomach and bowels were much less irritable, and the temperature had come down to 100.5° F. Thereafter the illness pursued an ordinary course, with rash on the 6th day, accompanied by enlarged tender groin glands, and a secondary rise of temperature to 101° F.

---

CASE 28. Dengue: Malaena &c.

Mrs B's child of 11 mos., had frequent slimy motions, mixed with blood, for a day or two previous to my visit on 28th Octr 1901. There was slight fever. Two moderate doses of castor oil cured the diarrhoea, but next day there appeared an erythematous rash all over the body and face, and this was accompanied by a temperature of 102.4° F. The child cried a good deal. On the 30th the temperature was normal, and the rash had disappeared. I did not again see the child, but there is little doubt that the diarrhoea was of the critical type, following the initial fever, which was overlooked by the mother.

Both the child's parents suffered about the



same time from the disease, the mother being then in the eighth month of pregnancy. The father shewed enlarged occipital and inguinal glands, among other more ordinary symptoms.

---

(b) HAEMOPOIETIC SYSTEM.

CASE 29. - Glandular enlargement - Character of.

B.T. aged 21, European, was taken ill with dengue symptoms on 26th Sept 1901. The pains were most marked in the tarsal joints, and he vomited once or twice, but otherwise there was nothing in his case calling for special mention, until the sixth day, when, with the appearance of a profuse, dusky, macular rash, the glands in both groins and along the left brachial vessels were found to be enlarged and tender. In the groins, both the inguinal and femoral chains were involved bilaterally, and the swellings varied in size from a pea to a pigeon's egg. Only one brachial gland was affected, and that was about the size of a hazel nut. The swellings were discrete, hard, with the skin freely moveable over them, and with no overlying inflammation. They were tender to touch, and caused some pain on movement of the limbs. They gradually subsided with the disappearance of the exanthem.



## CASE 30. - Glandular enlargement -

association of cutaneous erythema with.

Mr B. 45, complained, on 4th Octr 1901, of being "very bad" and unable to walk because of "excruciating" pain in the joints, particularly the tarsal joints; of an "all gone" feeling, and of nausea and giddiness on assuming the erect attitude. There was sleeplessness, restlessness, and a temperature of 102° F. The illness had begun on the previous day. Severe headache, pain on movement of eyeballs, stiff-neck, back-ache, deep-seated aching in the long bones, flushed face, dirty tongue, foul breath, loss of appetite, absence of taste, constipation &c were present.

5.10.01 - Temperature 100.5° F. In statu quo.

6.10.01 - Temperature 99 F. "Better", only weak, and no appetite: Pains now slight, and confined to loins and shoulders: Knees stiff - popliteal spaces feel filled up.

7.10.01 - Faint signs of rash on hands and forearms: Temperature normal.

8.10.01 - Rash general - face included - measles-like - the spots coalescing to form blotches two to three inches in diameter, in such situations as elbows, knees, calves and outer aspects of forearms: Some return of pains in limbs and back: Glands in groins, axillae, and posterior to Sterno-mastoids enlarged, tender and shotty, the size of small marbles.

Two days later the swellings had almost



entirely gone, and there were no traces of the rash. In the same house, an aged Malay watchman was very much crippled with rheumatic-like pains, following on an attack of fever. He complained too of inability to retain things in his grasp. He shewed traces of a rash. Mrs B's little girl aged  $5\frac{1}{2}$  years was said to have been delirious and to have passed blood in her stools. She shewed an urticarial rash. Mr S. a boarder was also attended by me at this time, through an ordinary attack.

---

CASE 31. Glandular enlargement with overlying inflammation.

Mr N. European, consulted me on 18th Octr. 1901, on account of diarrhoea and peculiar dusky rounded spots on his palms. I found that he had been ill with the usual dengue symptoms for four days, three of which he had spent in bed.

Two days later the rash was well-marked, but was already fading on the trunk. In the right parotid region was a tender hard glandular swelling the size of a small marble, and inflamed as to the overlying skin. It remained in this state for two days, then gradually subsided.

---

CASE 32. Early glandular swellings.



For another practitioner, I saw Mr. J. a Jew, on 22nd Oct. 1901. He had a bloated, bilious look. He gave the ordinary history of a three-days dengue illness, and shewed enlarged occipital glands, the size of beans, distinctly tender to touch, and mainly on the left side. I saw him again on the following day, when he shewed a slight rash on hands and forearms; also on the next day, from which date the glandular swellings gradually subsided.

This patient's wife also shewed enlarged glands posterior to the left Sterno-mastoid, besides traces of a rash.

---

CASE 33. Glandular enlargement with the primary rash.

W.K.S's daughter, Chinese, aged 18 years, was taken ill shortly after midnight, and seen by me at 9 a.m. of the 4th Decr 1902. The illness began with 'shivers,' then 'fever', general aching and sleeplessness. She had been quite well on the previous day. When seen she complained of pains all over especially on movements, and most marked in the back. There was also hemi-crania, pains in the eyeballs, the usual buccal and gastric phenomena, constipation, and a temperature of 103° F. There were flushed face, puffy eyelids, faint macular rash on chest and lower limbs, with slight oedema of the ankles. The legs, hands and



fingers shewed urticarial wheals. The finger joints ached, and there was great restlessness. Posterior to the Sterno-mastoids the glands were distinctly swollen and tender to the touch, and the patient herself called attention to others similarly affected in the inguinal region. The swellings were of the ordinary description.

5.12.02 - "Much better": Temperature normal: Rash all but gone: Glands less tender.

7.12.02 - Pains gone: No rash: Temperature normal: No appetite.

8.12.02 - Marbling of the dusky skin - pinkish spots on arms, hands and chest: Itching: Glands less prominent, not tender.

9.12.02 - Well-marked dusky red macular rash all over the trunk and lower extremities, with itching: Otherwise well.

---

CASE 34. Glandular swellings: No rash.  
A.B.W. Eurasian, aged 35, had to leave work on 29th Octr 1901, because of headache and pains in feet, elbows, and finger-joints. He was seen next day. There were present the well-known facies, the usual stomach symptoms, a temperature of 102.2 F. cough of several days standing, swelling over the dorsal aspects of both feet, giddiness and sleeplessness.



31.10.01 - "Somewhat improved": Temperature 101 F: Pains much less acute.

1.11.01 - Temperature normal: Joints still stiff: "Tired and weak".

2.11.01 - Occipital glands on right side enlarged and tender: "Lightning pains".

The rash was not observed though carefully looked for in this case.

---

(c) CIRCULATORY SYSTEM.

CASE 35. Dengue: Pseudo-Angina Pectoris.

On Octr 28th 1901, Mr N. aged 45, a long-time resident had much difficulty in getting from his trap into the consulting-room, because of pains in tarsal joints, ankles and back. He complained too of "feeling queer" - alternately hot and cold, nauseated and 'headachy'. He shivered slightly while in the consulting-room, and said that twice during the last few hours he required stimulants to prevent fainting. His illness dated from the previous day.

There was no recognisable cardiac lesion, and no thickening of the arterial walls. He had always been very moderate in the use of alcohol, but was a fairly heavy smoker, though, since the commencement of the present illness, he couldn't smoke because of nausea. His pulse was regular, 78 per



minute, and of good quality: Temperature 99.4° F.

Next day he fainted while at work, and very shortly afterwards was much alarmed by a sudden severe pain in the region of the heart, which "passed off in a few minutes". On the following day the pain returned, but was less severe. He was very giddy and weak, and complained of loss of memory and general mental haziness. The fever had gone however, and he was again getting about. A papular rash appeared on arms, neck and chest, on the fifth day, and thereafter recovery was rapid. The precordial pain did not return.

---

#### CASE 36. Onset with cardiac dyspnoea.

One of my earliest cases was that of Mrs L.K.C. a young Chinese woman, the subject of mitral incompetence. One morning, after some slight exertion, she was suddenly attacked with palpitation and great breathlessness. One hour later I found her with an extremely anxious expression, rapid laboured breathing, and complaining in a gasping voice of feeling very weak. There was no appreciable increase of cardiac dullness laterally however. The pulse was weak and very rapid, but regular. She had slight fever, and joint pains. On the following day the dyspnoea had entirely disappeared under rest and treatment; but there were well marked dengue symptoms.



## CASE 37. Dengue: Venous stasis.

Mr. G. aged 35, a cadaverous, Scotch engineer, complained on 24th Octr 1901 of pains in back of neck, right foot, one finger-joint, and "small of the back". There was slight swelling of the affected finger joint, also of the 'ball' of the affected foot. He further complained of stiffness in the right popliteal space, headache, sleeplessness and inability to turn in bed. His illness had begun with shivering on the previous day. There was marked malar flush, redness of chest, and to a less extent of the general body surface. His tongue was furred, and he was nauseated: Temperature 103.2° F. pulse 108. There was free perspiration.

Next day he was much improved and could walk: Temperature 100 F. On the fourth day there was marked, purplish mottling of the skin surface, especially well seen on the thighs - the blue-berry coloured patches varying in size from a pin's head to over an inch in diameter. The temperature was normal. The mottling gradually faded in the course of a day or two, and there were no further symptoms.

---

(d) RESPIRATORY SYSTEM.

## CASE 38. Dengue: Epistaxis: Sequel.

J. McN. a powerfully built police officer of plethoric



habit, aged 35, was completely prostrated by a severe dengue attack on 3rd Novr 1901. He couldn't walk for 24 hours. Two days of diarrhoea had preceded the onset. On Novr 4th his temperature was 102° F, and all the usual symptoms were well-marked, with the typical "boiled-lobster" facies. There was vomiting too, and the right wrist was specially painful.

5.11.01 - Sharp epistaxis of short duration: Temperature 100 F: Pains much less severe: Sleepless night.

6.11.01 - Gland swollen to size of hazelnut, and tender to touch in left groin (inguinal): Itching and tingling of skin.

8.11.01 - Rash macular, profuse, on chest, arms, wrists and palms.

19.11.01 - Sudden excruciating pain in lumbar region, "doubling him up" for some minutes, and rendering him unfit for duty for one or two days.

---

CASE 39. Dengue: Spasmodic asthma as a complication.

Late in the evening of 24th August 1903 I saw Mr P. a Spanish gentleman, but lately arrived in the Colony. He was suffering from a moderately severe attack of bronchial asthma, to which he was subject. There were the usual piping and snoring rales, but no distinct bronchitis. The temperature was 102° F. however,



and this together with certain other signs led me to suspect dengue, for which I accordingly treated him. The results justified my suspicion. The asthma disappeared in a day or two with the subsidence of the fever.

---

(e) INTEGUMENTARY SYSTEM.

CASE 40. Primary urticarial rash.

W.K.H's baby, aged 4 months, Chinese, was one of nine persons, living in the same house, who suffered from dengue on and about 9th Octr 1901. Among the first symptoms in this child's case were an urticarial rash - large raised, red wheals, with whitish centres - on upper and lower limbs, and less marked on the trunk; dry skin; a temperature of 103° F., great restlessness and quickened respiration. Next day the rash was almost entirely gone. The temperature gradually declined, reaching normal on the fourth day. A second rash appeared on the sixth day, on hands, feet, face and trunk, of papular character, resembling scarlatina, and with a temperature of 99.4° F.

---

CASE 41. Sudamina: Petechiae.

Mr S. aged 28. Scot. three years in East, a healthy subject, took ill from dengue on 22nd Octr 1901. The



onset was very sudden and severe, with the usual symptoms. His temperature rose to 103.4° F. in a few hours, with pulse rate 114. The facies was typical. The chest papillae were prominent, giving the "nutmeg grater" feel, with bright red spots around and between them, also many white points of sudamina. A trace of bile was found in the urine, but no albumin. The pains were pretty general. Several of the finger joints shewed puffy enlargement, and the hands as a whole were swollen. On the second day there was marked bromidrosis: Temperature 99.4° F. pulse 80.

4th day: - Diarrhoea: Hemicrania: Dark mottling on chest and arms: normal temperature.

5th day: - Bright red petechiae, size of small pins head, not disappearing on pressure, on a purplish mottled background: Situations, arms and chest.

---

CASE 42. Rash with erysipelatous characters. Mrs N. aged 30. had already nursed her boy with dengue for four days when she complained of pains, headache and fever. She was seen on 27th Octr 1901. Among the train of symptoms which confined her to bed were severe backache, puffy swelling of several finger joints, a painful, right wrist, and cramps in the muscles of the feet.

31.10.01 - Marked measly rash all over the body,



including the face. On the inner and posterior aspects of the left leg was a patch about one-fourth of the whole leg area, and extending almost the entire length of the tibia, inflamed, red and erysipelatous-looking, with clearly defined but not distinctly raised margin, hot to the touch, with prickling; tender feeling on superficial palpation, less tender to deep pressure, but causing pain on movement of the limb. On the outer aspect of the same leg was another similar patch, rounded, and about two inches in diameter. The foot and ankle were slightly swollen. Nose and ears were red, and shewed desquamation. The temperature was 99.5 F.

1.11.01 - Swelling of ankle less: Inflamed area not quite so prominent.

The condition gradually subsided in the course of a few days.

---

#### CASE 43. Erythema Nodosum.

Mr J. had in his house a Chinese boy aged 14 years, who complained to me of dengue-like symptoms on 18th July 1903. Instead however of an ordinary secondary rash appearing in due course, he developed erythema nodosum, with increased joint pains and constitutional symptoms on or about the fifth day. For some days thereafter a succession of inflamed, tender, nodular, bruise-like swellings came and went along the anterior



aspects of both tibiae, finally disappearing under rest, sodium salicylate and quinine.

Barely had this condition declared itself in the boy, before Mr J. was himself seized with dengue, which ran an ordinary course.

---

(f) REPRODUCTIVE SYSTEM.

CASE 45. Epididymitis: Dengue.

T.C. a Chinaman aged 20, married, came on 12th January 1904 and complained of pain and swelling in relation to the left testicle, of four or five days standing. He denied urethritis, and had had no injury.

All the signs of acute epididymitis were present, viz. -considerable swelling and hardness, exquisite tenderness and aching, in the epididymis, with scrotal oedema, slight swelling of the testicle, and pain along the cord. The usual constitutional symptoms were present, with some rise of temperature.

A week later he returned and complained of fever, headache, pains all over the body, and general "seediness", for the last two or three days. Some hardness of the epididymis remained, but the tenderness had gone.

In two more days he shewed a well-marked, dusky-red, maculo-papular rash on chest, abdomen, face and arms, closely resembling measles, itching slightly, disappearing on pressure. There was a diffuse redness



over the brow. The throat was congested, the tongue furred, the temperature 100.6° F. and pulse 108. He is sleepless, and feels weak, nauseated, without appetite, and with bitter taste in the mouth. Bowels are constipated. There are no enlarged lymphatic glands.

Next day the rash was much more profuse, in fact little unaffected skin remained, more especially on the back and hips and in the perineal region and thighs adjacent. The temperature was 99.5° F.

Improvement now set in as in most other cases, and by the end of two days all trace of the rash had gone from the body, only slight redness remaining in the perineum, on the site of a previous dhobie itch. Convalescence was rapid and uneventful. There was no urethral discharge. Patient had had measles as a child.

---

CASE 45? Dengue: Disturbed menstruation. Miss G. aged 27. Could not walk without great discomfort for two or three days, because of the severity of the dengue pains. Menstruation came on with the initial fever, five days before the usual time, and continued for five days instead of the habitual three. She shewed a measly secondary rash and enlarged groin glands.

---



## CASE 46. Dengue in Pregnancy.

Mrs N. aged 22 was  $7\frac{1}{2}$  months pregnant at the commencement of her dengue attack on 14th Octr 1901. She suffered somewhat severely, being completely prostrated for two or three days, while giddiness and nausea persisted for several days longer. On the fourth day she had cold extremities, with subnormal temperature. The lumbar pains were specially severe. Chloasma uterinum was well marked, and was accentuated at first by the primary erythema, and later by a very profuse, measly eruption. This last was very general, and some of the individual spots were  $\frac{3}{4}$  inch in diameter. The pregnancy went on to full term when she was delivered of a healthy male child.

---

## CASE 47. Dengue in early pregnancy.

Mrs R. was about one month pregnant when she contracted dengue on 6th January 1903. Though the attack was fairly severe, with a temperature of  $103^{\circ}$  F. in the initial stage, there was no menstrual disturbance. Six days before, as the result of a carriage accident, she had sustained a sprained ankle, a scalp wound and other bruises. Subsequently the dengue pains affected the injured joint more than the others. She had suffered from digestive disorder, and acne vulgaris for years, and these conditions were now greatly aggravated, and morning sickness persisted from the

time of the dengue attack until well on into the fourth month. The secondary rash was of a papular character, with great itching.

Thirty-six hours from the commencement of her illness, her husband was 'laid up' with the disease, also her sister - in the same house - a few days later.

---

NERVOUS SYSTEM.

CASE 48. Dengue: Sensory Disturbances, J.N. an Eurasian, telephone operator, aged 18, complained to me of the usual dengue symptoms viz:- pains, headache, fever and stomach disorder, on 30th Octr 1901. The illness had begun with slight shivering twenty-four hours previously.

His expression was pained. Inside the lower lip were several small vesicular ulcers and a few red papules. The gums were tender. There were giddiness and squeamishness on getting up: Temperature 101.5° F. pulse 96. Other symptoms were absence of taste - "everything tastes alike", - slight deafness, sleeplessness, loss of appetite, constipation and slight cough. The "head feels heavy": Urine healthy: Skin hot and moist.

31.10.01 - Slept well: "Slightly better".  
Out of bed: Temperature normal: Pulse 80.

1.11.01 - Giddiness and weakness in back and



legs, with loss of sensibility to touch, to pain, and to temperature over both gastrocnemii: Tendon reflexes normal.

2.11.01 - Numbness and loss of sensibility all but gone: Muscular weakness remains.

3.11.01. - Slight macular rash.

---

CASE 49. Dengue: Sensory and motor Disturbances.

Mr. F. aged 35. intelligent and of steady habits, had the typical "boiled-lobster" look, with severe pains vomiting and other symptoms, when I saw him on 13th Octr 1901: Duration of illness twenty-four hours. He further complained of pain in the testicles, which were tender to touch, but not swollen. The urine "smells like that of a horse". Temperature 102 F.

14.10.01 - "No sleep last night again": Diarrhoea - 12 peasy motions without pain or straining: Temperature 100 F.

15.10.01 - Slight papular rash on outer aspect of forearms. Numbness with loss of sensibility to touch over both calves, and muscular weakness on sudden effort - he came to his knees on getting up suddenly from his chair: Also occasional stabbing pains in calves. He experiences great difficulty in getting down-stairs, because of muscular pains and weakness. He finds it easier to get down backwards:

Temperature normal.

21.10.01 - "Lost 12 lbs in weight during first four days of illness": "Great-development of measles-like rash on 17th and 18th": "Unfit for work on these days": "A drink or two suffices for dinner even now": "For the last five days there has been a persistent pain in the left ankle".

---

CASE 50. Dengue: Localised oedema.

Mr S. about 25, a clerk, was suddenly seized with dengue on 24th September 1901. Among other symptoms he shewed great, baggy swellings of the lower eyelids, on the third day. The upper lids were also slightly puffy, and the palpebral fissure was narrowed to a mere slit. The urine was healthy.

Two days later the face was normal in appearance.

---

CASE 51. Dengue: Trophic changes.

Mr McC. five months out from Glasgow, took ill from dengue on 13th July 1903. There were three other cases in the house about this same time. Among his symptoms which were of more than average severity - he was confined to bed for four days - were swelling of the upper eyelids, and of the tarso-metatarsal



joint of the right great toe. The joint was painful on movement but did not pit on pressure nor could fluctuation be felt, The swellings had gone in two days.

Three weeks later this patient came again with a puffy swelling of right ankle, tender to touch and painful on movement. It had developed somewhat suddenly without injury or other specific cause. It disappeared in a few days under treatment.

---

CASE 52. - Intense excitement following on an attack.

On May 16th 1902 I was called to see T.W.N. a Chinese girl aged 11 years, who, along with her father and mother, had been suffering from dengue for the last three or four days.

The history given was that since early morning she had had repeated attacks of loud screaming, clinging to her mother meanwhile, as if in mortal dread of something - she would not say what - and calling on father and mother to protect her. The fits, which began and ended abruptly, lasted from  $\frac{1}{2}$  to 1 minute, and were followed by a period of calm and a tendency to sleep, from which on being roused she immediately started screaming again. Remonstrances and assurances of safety were equally useless. She was yelling vociferously with eyes staring as I

approached. With difficulty I made out that the temperature was normal; skin cool; pulse slow and weak; pupils reacted normally. The bowels were regular, and there was no special complaint and no vomiting; No history of fright.

All excitement had disappeared by the following day, under treatment.

---

CASE 53. Loss of nerve control preceding an attack.

H.Y.M.'s daughter, Chinese, and aged  $11\frac{1}{2}$  years, suddenly, on 28th Sept 1902, developed symptoms of extreme fright with great restlessness, - tossing from side to side, crying, and flinging her limbs about. The eyes were sometimes staring, and wild, at other times half-closed; Respiration 'gasping'. The immediately exciting cause was thought to be her father's suggestion that she should have an aching tooth extracted. Her temperature was normal. Next day she had much improved. The attacks were much less violent, and with a longer interval between. Now however the temperature was  $101^{\circ}$  F. and it rose to  $103^{\circ}$  F. in the evening but fell again to  $100.2^{\circ}$  F. on the following morning. The excitement had all but passed off by this time, an occasional inclination to cry being now the only manifestation, and even this was soon overcome.



4.10.02 - Epistaxis: Slight diarrhoea:

Temperature normal: All trace of nerve storm passed.

5.10.02 - Gums bleeding, otherwise practically recovered: No rash detected.

---

CASE 54. Dengue: Mental depression:

Defect of memory.

I was brought off to see Capt McG. a local skipper, on 11th Octr 1901, and found him in the acute stage of dengue, with flushed face and very melancholic aspect. All the usual symptoms were present, with much pain on movement, and a temperature of 104° F: pulse 92. There was great depression of spirits, and much mental confusion, as evidenced by wandering attention, hesitating speech, and loss of memory for even the most ordinary words, and for dates &c, and a certain listlessness of manner. Sleeplessness and numbness of left arm were present and he said his "body feels like a block of wood".

The temperature began to fall almost immediately, and pari passu the other symptoms declined. Diaphoresis and a good sleep on the third night helped recovery greatly, and the mental haze had quite cleared by the fourth day, though the joint and muscle pains persisted for some days longer, and he complained of being "weak and useless" and of dreaming. Small vesicles shewed on the lips on the sixth day; these

resembled herpes. There was also a slight macular rash on the arms, while the thighs and scrotum shewed considerable venous stasis, being quite livid at parts.

---

CASE 55. Dengue: Delirium: Sleeplessness.

D.N. aged 5 years, was seen on 24th Octr 1901.

History:- On the previous day his ayah had been sent away sick, and a few hours after, the child complained of pains in the fingers and head. Then followed shivering in the evening, 'wandering' during the night, almost absolute sleeplessness, great restlessness and tossing from side to side, excitement - talking, crying, singing and screaming - with vomiting at intervals.

He was less restless at the time of my visit, but somewhat dazed and stupid, with bloated face, very offensive breath, a temperature of 103° F. and a strong hard pulse - 152 per minute, There was slight bronchitis of two or three days standing. The skin was hot and dry: Urine healthy.

(see Chart 6. page 20)

For three days the restlessness continued almost without intermission, the while the temperature gradually declined to normal; and he scarcely slept for more than an hour at a time. He vomited repeatedly, and slight traces of blood were seen in the vomit. After 6½ hours sleep on the fourth night, he woke up



much brighter, only slightly deaf and shewing the beginnings of a pinkish macular rash on the hands, Perspiration was still absent.

Thereafter recovery was rapid. Both parents suffered from the disease a few days later (see cases 35 and 42).

---

CASE 56. Dengue: Convulsions.

On the morning of 9th Novr 1901 I was hurriedly summoned to see Mrs D's child, aged 2 years, who had "taken a fit". I found him asleep. He seemed dazed on being roused.

History:- "Peevish" for a day or two: Refused food since previous midday: Vomited last evening and slept very badly: Convulsion, sudden with squinting, noisy breathing, rigidity, and general jerky movements, lasting about ten minutes: Other dengue cases in the house.

Objective symptoms:- Face flushed and swollen, eyes injected: Papular erythema over chest: Breath foul: Tongue coated white, and constantly in motion, as if trying to get rid of something disagreeable in the mouth: Skin hot and burning: Temperature 102° F. Rapid pulse.

The temperature fell by crisis. The subsequent history was not specially important.

---

## CASE 56a. Dengue: Cerebro-Spinal

Meningitis: Death.

Mrs C's child, aged 9 mos, plump and previously healthy, was seen by me on the evening of 9th Novr last, in convulsions. There was no history of injury. A hot bath and a rectal injection of bromide and chloral allayed the irritation and secured a good night. Next day she seemed well, but had a temperature of 101.5° F. flushed face and general skin congestion. There was slight bronchial catarrh with cough, but no lung involvement.

The fever increased, and on the morning of the 11th she was listless and drowsy. The bowels had moved freely. The same evening there was marked stupor, and the temperature ranged between 104° and 105° F.

There was a slight intermission of the stupor on the 12th, but by the evening of the 13th coma was complete, and the following symptoms were present:- Strabismus, retraction of the head, twitching of facial muscles, clonic spasms of the arms and legs, and a degree of opisthotonos. The temperature was high but somewhat remittent, and the pulse was very rapid.

Feeding and medication per rectum had now to be resorted to. Later Cheyne - Stokes breathing occurred, and death took place on the 17th, with a moderate hyperpyrexia.

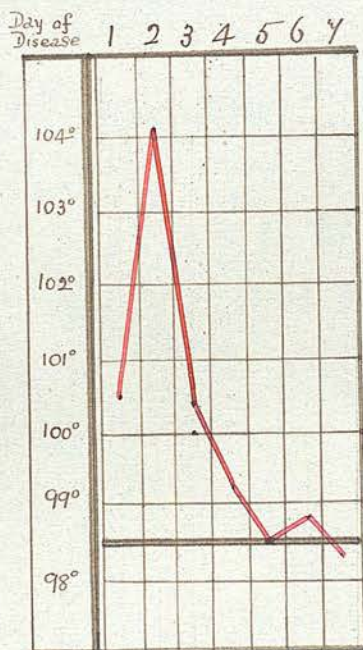
---



CASE 57. Extreme Mental Depression as a sequel.

D.N. aged 22, clerk, 18 mos in the East, of nervous temperament, came on the afternoon of Novr 26th 1902 and complained of aches and pains, headache and fever. He had been "fairly well" in the morning, though slightly "out of sorts" for two or three days. Onset of symptoms occurred about two hours previously, with stiffness in joints on leaving the Office stool. When seen, his temperature was  $100.5^{\circ}\text{F}$ .

27.11.02 - Sleepless night: morning temperature  $104^{\circ}\text{F}$ : All the ordinary dengue symptoms present in marked degree: Evening temperature  $104^{\circ}\text{F}$ .



Temperature Chart. D.N.

28.11.02:- Diarrhoea all day, but nevertheless 'feeling better': Much less pain than previously.

29.11.02 - Previous night again sleepless: Tender swollen glands posterior to sterno-mastoids: Pains gone.

2.12.02 - Profuse general measly rash: Extensive glandular enlargement in groins, axillae, posterior and anterior to sterno-mastoids, and in submaxillary region: Swellings size of beans: Not yet equal to leaving bed: Itching.



5.12.02 - Walked into consulting room in a gingerly manner: "Knees very weak": Feels "very rocky", and looks pale and thin: Complains of want of appetite: Recommended a sea trip.

He went to Sarawak. Twelve days later he returned, and on his arrival I was called to see him, as his behaviour was causing his friends some anxiety. He had gone to bed immediately on reaching home at noon, had refused to speak except in monosyllables, would give no account of himself, took no interest in his surroundings and seemed in very low spirits indeed. And all this was in direct contrast to his usually lively disposition. In answer to my inquiry as to why he took to bed, he said he "wasn't feeling very well", and when asked to state what he felt, said he "didn't know", and beyond an occasional 'Yes' or 'No' to a direct question this was all the information one got as to his subjective symptoms.

The liver was normal in outline; there was no specific ailment' No business or other worries disturbed him.

Treatment:- An attendant for a day or two, rest, tonics and good food.

Result:- He began to brighten up in a day or two, and at the end of ten days returned to Office in his normal health.

---



## CASE 58. Hysteria as a complication.

Mrs C.S.K. a fat flabby Chinese woman at the menopause, the primary symptoms in whose case were great pain in the head and back, diarrhoea, a temperature of 104° F, and a degree of mental confusion almost amounting to stupor, suddenly developed hysterical symptoms on the third day - tossing from side to side, flinging her limbs about at intervals, and resisting all attempts on the part of her friends to move or to feed her.

The convulsive element was absent on the following day, but the semiconsciousness remained for about two days longer, after which, with the fall of temperature to normal, she finally came to herself and made a speedy and satisfactory recovery. There was no history of previous hysterical attacks.

---

(h) LOCOMOTORY SYSTEM.

## CASE 59. Pains of ordinary type. . . .

W.K.H. Chinese Baba aged 25. complained on Novr 9th 1901 of pain and swelling of the right foot, pain in the right arm - shoulder and elbow - in both popliteal spaces, and in the fingers; also of headache, stiff-neck, fever and "haziness". He had gone to sleep in a long chair on the previous evening, and on waking up at midnight experienced such severe pain in the right ankle with stiffness in other joints on movement,

that he "had to crawl to bed". He passed a restless night, sleep was broken by dreams and nightmare.

He avoids active movement. Temperature is 101° F, and the usual constitutional symptoms are present.

10.11.01:- Pains much less, admitting of greater freedom of movement: Comparatively comfortable when at rest: Temperature 102° F.

11.11.01 - "Better", out of bed: Slight diarrhoea: Boring headache in temples: Swelling on dorsum of right foot entirely gone: Can get about with almost perfect freedom, only slight stiffness remains.

12.11.01 - Gone to work.

14.11.01 - Profuse, general, pinkish, papulo-macular rash, confluent over knees and elbows: Itching: Slight deafness: Temperature normal: No pains.

---

CASE 60. Ordinary pains - course and character of.

T.M.T. Baba, aged 28 was in extreme distress and lamenting greatly on the morning of 15th Septr 1901, because of severe aching pains all over, but especially in the back on movement, and in the head. He had been quite well on the previous evening whereas now he was completely prostrated. His expression was



pained, even to tears, and when asked to move slightly in bed, did so with the greatest difficulty. His temperature was 103.5° F.

Next day he was much more comfortable when at rest, only the severe headache persisted, and muscular movement was still very painful, and the sleeplessness very trying. He was much better on the third day and could move about with comparative freedom. A slight stiffness after resting persisted for a day or two longer.

---

CASE 61. Illustrating fleeting character of pains and swelling.

R.B. 48 years of age, 11 years in the East, complained on 15th Novr 1901 of very severe pains in the back and lower limbs, especially on movement, suddenly developed. It was with difficulty that he managed to get up from the tiffin table and into bed, where he lay practically unable to move. Other symptoms were cold feet with numbness, "pins and needles" in the fingers, stiff-neck, vomiting, sore throat &c &c.

There was distinct puffiness around both ankles.

18.11.03. Backache gone: severe pain with "creaking" on movement over left tendo-achilles:  
General stiffness: Roseolar rash, diarrhoea, giddiness and other symptoms.

20.11.03 - Diarrhoea: Oedema on outer border of left foot over tarso-metatarsal joint with pain on movement.

22.11.03 - Pains and swellings quite gone: Health normal.

---

CASE 62. Pains - general character of Mr L aged 25, Austrian, a B.Sc (pure science), and some-time student of medicine of Vienna, complained to me on 6th Novr 1901 of headache, severe pains in the back on movement, aching all over the body, and fever. He was restless and unsettled, couldn't find an easy posture, and couldn't sleep. The illness began on the previous afternoon with shivering and a temperature of 102°F. Then followed the symptoms mentioned above, with pain on movement of the eyeballs, extreme difficulty in getting up from his couch, and "an inclination to moan for relief". He specially drew attention to a perversion of taste. "Everything tastes sweetish". "Tongue feels as if covered with cotton wool". The sickly odour from his breath was very marked.

7.11.01 - "Considerably more comfortable". Temperature 100.2°F.

8.11.01 - "Improving", can move with greater freedom; Pains gone, excepting the backache and pain in one calf: Stiff on getting out of bed: Difficult



to get up from recumbent posture: "Weak": "Couldn't read yesterday, can today": Slight diarrhoea, with frothy stools: Complete anorexia.

12.11.01 - Extract from note received from patient this day -

"Am getting on fairly well. Fever left me "on Saturday (i.e. 9th F.W.M.), and the exanthem "came out very distinct on the hands and legs. It was "measles-like, and lasted 2 days. No itching. Now "I feel queer pains in the knees and ankles, which "are strongest after some rest, and disappear with "exercise. Appetite is very bad, and I feel all "round rather shaky".

---

#### CASE 63. Pains of more than average severity.

W.T.H. A middle-aged Chinaman consulted me on the afternoon of 19th June 1903 on account of fever and pains all over the body - head, back, knees, feet, wrists and fingers - of  $2\frac{1}{2}$  hours duration. Movement aggravated the pains. There were no swellings. The temperature was  $102.5^{\circ}\text{F}$ . He had had slight cough for two or three days.

I visited him on the following morning. He had had a very bad night. What with the very severe headache, the uncontrollable restlessness, the persistent aching in bones and joints, demanding repeated change of posture, and the great pain in



joints and muscles on active movement, sleep was utterly impossible. His temperature was now  $103.8^{\circ}\text{F}$ , with the usual associated phenomena, and it was only with great difficulty, and after suffering extreme pain, that he could turn in bed, and he needed help to sit up. The facies was very typical, the cough was worse and there was marked absence of perspiration.

21.6.03 - Temperature  $100.5^{\circ}\text{F}$ . "Feel better": Less restless, and free from pain, except headache, when at rest.

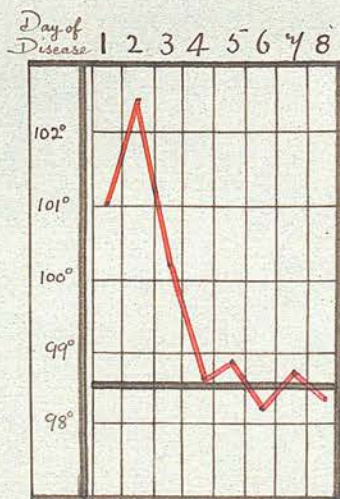
23.6.03 - Sleeplessness, giddiness, weakness and anorexia still present: Pains but slight, and only on active movement, in feet and back: Dusky-red rash with itching and desquamation.

#### CASE 64. Pains of a mild type.

Mr M. aged 30, in the East  $2\frac{1}{2}$  years complained of pains in back and right knee with slight headache and

fever on 12th Octr 1901.

He had to leave work in the morning because of tendency to fainting. He couldn't or daren't fully extend the right knee joint. Next day the right tarsal joints were also painful on movement.



Temperature Chart. Mr. M.

By the end of the third day

however, he was entirely free from pain and there was



no return. In other particulars the case was of the ordinary type.

---

CASE 65. Severe Pains.

F.F. aged 20, slowly and painfully, with groans, and some help from the various articles of furniture, shuffled his way like an old man crippled with rheumatism, into the consulting room, on 12th Octr 1901, and straightway had a rigor - his teeth chattering. He complained of great pain, especially in the back, right knee and shoulder, and head; had a very woe-begone look, and was breathing heavily and rapidly. The illness had begun on the previous afternoon with various vague pains &c. He had been unable to extend the right knee on getting out of bed, nor could he now close his hands without much pains. Temperature at 10 a.m. 101° F. pulse 144; at 11 a.m. 102.8° F. pulse 120. There were the usual constitutional symptoms, and a scarlatina-like rash over face, chest and abdomen. The middle joint of the right index finger is swollen, tender and painful on movement but there is no fluctuation. He experienced great difficulty in getting on his shoes and stockings, while in the consulting room.

13.10.01 - "Much better"; Temperature normal, pulse 100: Weak: No cardiac murmurs: Pain in back and right knee much modified.

14.10.01 - Temperature normal, pulse 84: "Improving", though pain in back with stiffness in other joints persists to a considerable degree, also pain in muscles of right calf.

15.10.01 - Pain in back less, but now pain on movement with tenderness to touch around the left tendo-Achilles. "Still weak".

16.10.01 - Slight rash with temperature 99.8 F. Pain over tendo-Achilles - both sides, also in knees causing stiff gait.

---

CASE 66. Pains of very general distribution. Mr P. aged 20, two years in the East, of sanguine temperament, was seen on 7th Novr 1901. Complaint:- "Headache, aching in every bone in the body: Cant lift anything for pains in wrists: Pain in front of chest on drawing a deep breath: Can scarcely stand for pain in right knee and in back: Cant eat solid food because of stiffness and aching of the jaws: Great difficulty in dressing: Pain behind eyeballs on movement: Walking is torture: Stiffness behind both knees - a feeling of filling up of the spaces".

There were no joint swellings, but the right knee looked redder and felt distinctly hotter to touch than the left. He woke up with these symptoms in the early morning, since which time they had much increased in severity. There had been a slight initial



shivering. He had had symptoms of cold in the head for two or three days. There is flushed face, slight catarrhal stomatitis and gastritis, and a temperature of 102° F. Tendon reflexes are normal.

Two days later the pains had quite gone, and only slight stiffness remained for another day or so. The rash came out on the 6th day, and on the 8th day he complained of backache, which however only lasted about twenty-four hours.

---

CASE 67. Localised Pain.

Mrs B's child aged 8 years, on waking up on the morning of 5th May 1903, complained of severe pain in the left foot, also slight aching in the right. Walking was altogether too painful, she had to be carried. She had had mild fever, and was generally "out of sorts" for a day or two previously.

There was considerable tender swelling over the dorsum of the left foot, in the region of the tarsometatarsal joints of the outer three toes. Passive movement was painful. There was increased heat to the touch: No fluctuation: Temperature 100.7° F. No cardiac symptoms.

Two days later the pain and swelling had both entirely disappeared, and the child was playing around.

---

## CASE 68. Pain and swelling.

Mrs B.T. a Chinawoman, aged 29, complained on 9th Octr 1901 of headache, stiffneck inability to raise her arms without pain, or to walk without great discomfort, because of pains in back and hips, and "soreness" all over: Duration of illness, a few hours only: Other dengue cases in the house.

She is fat, flabby, with weak circulation, and seems stupid: Facial appearance fairly typical: Temperature 103 F. with the usual attendant phenomena. There is a puffy tender swelling over the dorsum of the left foot.

10.10.01 - Temperature 102° F. pulse 120: Slight vomiting: Tingling and prickling on shutting hands: Bone and joint pains much less prominent.

11.10.01 - Temperature 99.6° F. pulse 112: Pains now only slight on movement: swelling of foot slightly less, and tenderness gone: Giddiness.

12.10.01 - No pains: Temperature normal.

13.10.01 - Macular rash with itching: Temperature 99° F, pulse 100; "weak".

---

## CASE 69. Pains recurring and persisting.

F.E. lawyer, aged 35 developed fever, headache, pains in joints and extreme restlessness, on 8th Sept 1901. He had had slight malaise, with aching in joints, and want of appetite, on the previous evening and had slept badly. His mess companion was in the stage of



secondary dengue rash.

At the time of my visit backache and severe pain in the tarsal joints confined him to bed. In addition his face was flushed, chest red, and he was nauseated. The headache was severe: Temperature 101.2° F. pulse quick and full.

9.9.01: Slightly better: Pains less acute: Still restless and sleepless: Temperature 100° F.

10.9.01 - Temperature normal this afternoon: "Greatly improved, only stiff and restless".

11.9.01 - Intense itching, with papular rash, on hands and forearms- Cant settle to work: "Weak but sleeping better": Movements still impeded.

13.9.01 - Increased pain and stiffness in joints after playing tennis: "Weak and restless".

16.9.01 - "Gaining strength but joints still stiff and painful". Temperature normal.

1.10.01 - Exacerbation of rheumatic-like pains in left arm and shoulder, with stiffness in other joints, but no swellings.

4.10.01 - "Pains get worse" "Can scarcely get in or out of trap in the mornings, somewhat better in the afternoons."

8.10.01 - Pains now in ankles, right shoulder and left elbow, worst in the mornings - walks like an old man on first getting out of bed: Pains vary in severity on different days.

7.11.01 - Still complains bitterly of pains

and great stiffness in the mornings, chiefly in the feet.

---

CASE 70. Marked joint Sequelae

Mrs W. thought she had Influenza when she called me in on 15th Sept 1901. There was aching and pains all over, headache, fever and nausea. Her two children had had similar symptoms four days before, and were now recovering (N.B. They showed a marked rash two days later).

After playing tennis on the previous evening she began to feel ill, and passed a restless night. The dengue facies was typical, and the usual constitutional symptoms were present. The temperature was 102° F. All the joints pained on movement, but especially the right knee.

16.9.01 - Severe pain and tenderness in eyeballs, also in back and calf muscles, but general joint pains and headache much less: Nausea at sight of food: Temperature 102° F.

19.9.01 - Beautiful roseolar rash over arms, chest and abdomen: Slight itching: Vomiting: Temperature 100° F: Pains more prominent again: Sleepless.

25.9.01 - Pains in knees, arms and ankles with oedema in the latter situation.

15.10.01 - Several finger joints - interphalangeal - swollen and painful on movement;



Swellings fluctuating.

---

CASE 71. Dengue: Cardiac Failure.

Alli, a Kling-Malay, born in Penang, one year resident in Singapore, a gardner, and aged 28 years, came on 2nd Feby 1904 and complained of pain in the left knee, fever, weakness, headache, 'bad-taste', no appetite, and nausea. The illness began on the previous evening with a chilly feeling. He had slept badly, and felt giddy on getting up in the morning, and "couldn't see straight". There was also pain on movement of the eyeballs, which were tender to touch; Bowels constipated.

His tongue was dirty brown, but moist: Temperature 103.1° F. pulse 122. There was no swelling of the knee and no pain on percussion, nor on passive movement, only a constant dull ache and pain on walking. There was slight pain in the right knee also.

3.2.04 - Pain has pretty well gone from the left knee, but is more severe higher up the leg. Left elbow slightly painful. He is too weak to walk without support, and indeed can scarcely sit up - his head droops. He had not slept. The nausea remains, also the anorexia, the bowels had moved once: Tongue moist: Temperature 102.8° F. Pulse 128. (N.B. Five minutes later 76, weak.)

4.2.04: Excessive weakness complained of -  
moaning: Temperature 101.2°F. pulse 128, very weak.  
He died at 8.30 this evening.

Two blood films taken on the first day and  
examined for the malaria parasite gave negative results.

---



R E F E R E N C E S .

1. An Epidemic of Dengue Fever by F.O.Stedman M.D. Bs (Lond) Hongkong. Brit.Med.Journal.Vol2.1902
2. Assoc<sup>n</sup> Intelligence - Hongkong & China Branch - Brit.Med.Journal Vol 1. 1902.
3. The Climate and Diseases of Bangkok by P.A. Nightingale M.D. Brit.Med.Journal Vol 2. 1902
4. Dengue Fever in Penang by F.M.T.Skæe M.D. Brit. Med. Journal Vol. 2. 1902.
5. Dengue Fever in Burmah by W.G.Pridmore Cap. I.M.S Brit.Med Journal Vol 2. 1902.
6. Dengue in Hawaii. Brit.Med Journal Vol 2. 1903.
7. Epidemic of Dengue Fever in Canton China by W.J.W.Anderson. Lancet Vol 1. 1903.
8. Mosquitos and Dengue Fever. (Dr Graham) Lancet. Vol 2. 1903.
9. Dengue in the Near East. Lancet Vol 1. 1902.
10. Mosquitos and Dengue. Journal of Tropical Medicine August 15. 1903.
11. Dengue. Journal Trop. Med. Aug 15. 1903.
12. Diseases of warm countries. Scheube 1903.
13. Mansons Tropical Diseases 1903.
14. Diseases of Tropical Climates. Maclean 1886.
15. Taylor's Practice of Medicine 1893.
16. Cyclopaedia of Diseases of Children - Keating. Article by R. Matas M.D.
17. Yellow Fever and Dengue - American Med. Assn". Brit.Med.Journal Vol 2. 1898
18. Boo-Hoo Fever. Brit.Med. Journal Vol 2. 1898
19. Dengue Fever at Sydney - Medical News - Brit.Med. Journal Vol 1.1898.
20. Dengue Fever in Queensland Lancet Vol 1 1898
21. Dengue Fever at Hongkong Brit.Med.Journal Vol 2. 1895.
22. The Eruption of Dengue. Lancet Vol 2. 1893.
23. A comparison between Dengue and Influenza by F.M.Sandwith. Lancet Vol 2. 1890.
24. Epidemic of Dengue Fever. Medical Societies. Lancet Vol 2. 1890.
25. Daggeian Fever - Lancet Vol 2. 1889. Berlin Correspondence.
26. Dengue or Influenza - Lancet Vol 2. 1889
27. The Epidemic of Dengue Fever at Smyrna Lancet Vol 1. 1890.
28. Dengue in Egypt by F.M. Sandwith. Lancet Vol 2 1888.
29. Osler's Principles & Practice of Medicine. 3rd edition.
30. Bristowe's Medicine 1882.
31. Reynolds' system of Medicine - Article by W. Aitken M.D. 1870.

32. Principal Civil Med. Officer's Report for Hongkong 1902.
  33. Reports of P.C.M.O. for Singapore 1901, 1902.
  34. The first recorded appearance of the modern Influenza Epidemic by James Cantlie M.B. F.R.C.S. Hongkong. Brit. Med. Journal Vol 2. 1891.
  35. Dengue - Epidemic of, in Spain, 501; etymology of, 879, 931. Brit. Med. Journal. Vol. 2. 1891
-